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OCTOBER 1982 THE NAVAL AVIATION SAFETY REVIEW

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Hang in there, guys

Courtesy of *Kitty Hawk Kites*

SEVERAL unusual near-midairs have been reported to us lately. Parachutists dropping into an approach corridor and a guy soaring 16,000 feet into the wild blue yonder in a *Sears* deck chair attached to weather balloons come quickly to mind. Now we've got another one for you, so read on:

During descent for downwind entry to Runway 21 at NAS West Coast, an A-6 and an F-14 flying in formation saw what appeared to be several light aircraft along their intended flightpath. The light aircraft were maneuvering about 1 to 2 miles away. The two jets turned to provide separation, but when they leveled off, it became obvious that the "light aircraft" were ultralights and hang gliders and had not moved. Initiating an immediate left turn, the *Intruder* and *Tomcat* missed the brightly-colored gliders by no more than 500 feet.

Worried by this hazard, NAS West Coast contacted the General Aviation District Office and asked if this type of activity is legal in the vicinity of airfields. The answer, it appears, is that no punitive action can be taken, even if the parties are known, **since ultralights and hang gliders are not governed by FAA Regulations.**

The CO of NAS West Coast had this to say: "The trend in aviation has been toward more positive control to enhance the ability to operate aircraft safely in an increasingly crowded and complex environment. Because the use or misuse of hang gliders and ultralight aircraft can significantly endanger the lives of those fliers who are governed by regulations, the operators of these aircraft should also be governed by regulation. In any case, acute lookout must be maintained."

The NAS West Coast CO is right. For thousands of years, would-be Leonardo da Vincis have tried their wings at flying. There's little doubt that they'll continue to do so. With this in mind, naval aviators must continue to watch out for experimenters as well as conventional aircraft. Hang in there, guys!

Russ Forbush

Late Update: The NAS West Coast CO's wish has partially come true. Effective 4 October 1982, hang gliders and ulralights will need prior permission from Center before flying into airport traffic areas and control zones. Still, the FAA will not be requiring hang gliders and ultralights under 254 pounds to be registered or certified. This exempts virtually all aircraft of this type. — Ed.

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Wingtip vortices appear briefly on this F-14 during a high-performance maneuver in the Atlantic. See Russ Forbush's story on the invisible dangers of wake turbulence, p. 16. Photo by PH3 Todd W. McClaskey, USS CARL VINSON (CVN 70).

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COMMAND

From CY 1977 through 1981, a total of 291 Class A FM/FRM aircraft mishaps occurred in which pilot error was cited as a cause factor. Of this number, 58 were command-related; some 20 percent of the total. The few described below run the gamut from a momentary breakdown in proper operating procedures to a serious disregard for written regulations. A review of such mishaps should prove to all those who currently command, as well as those who aspire to do so in the future, that effective leadership is a 24-hour-a-day job. Anything less will open the door to disaster.

• • • and aviation safety

By Russ Forbush
APPROACH Writer

COMMAND is the snow-covered mountain peak that every career naval aviator dreams of scaling. Unfortunately, there are far more with the credentials to climb than there are Matterhorns to conquer. With this preponderance of talent, however, you'd think the lifeline suspended from a CO to his squadron would never snap. Unfortunately, no selection system is infallible.

There simply isn't any foolproof method for determining exactly how successful a CO will be once he takes command. The great majority of our aviation COs serve with distinction, but, as in every profession, there are those who fail to fully measure up. Some make only one costly error, while others, in the dubious interest of expediency, perhaps while dreaming of even higher summits, foster a disregard within their units for established training, operating, and safety procedures. Others may find it difficult to cope with the pressures associated with command, and then there are the few who flagrantly flaunt written regulations to serve their own individual interests. Whatever the reason, the CO who fails to live by the book, or has an unprofessional attitude toward naval aviation, wittingly or unwittingly provides an environment rampant with mishap potential, both on the ground and in the air. The following mishap briefs amply illustrate the point:

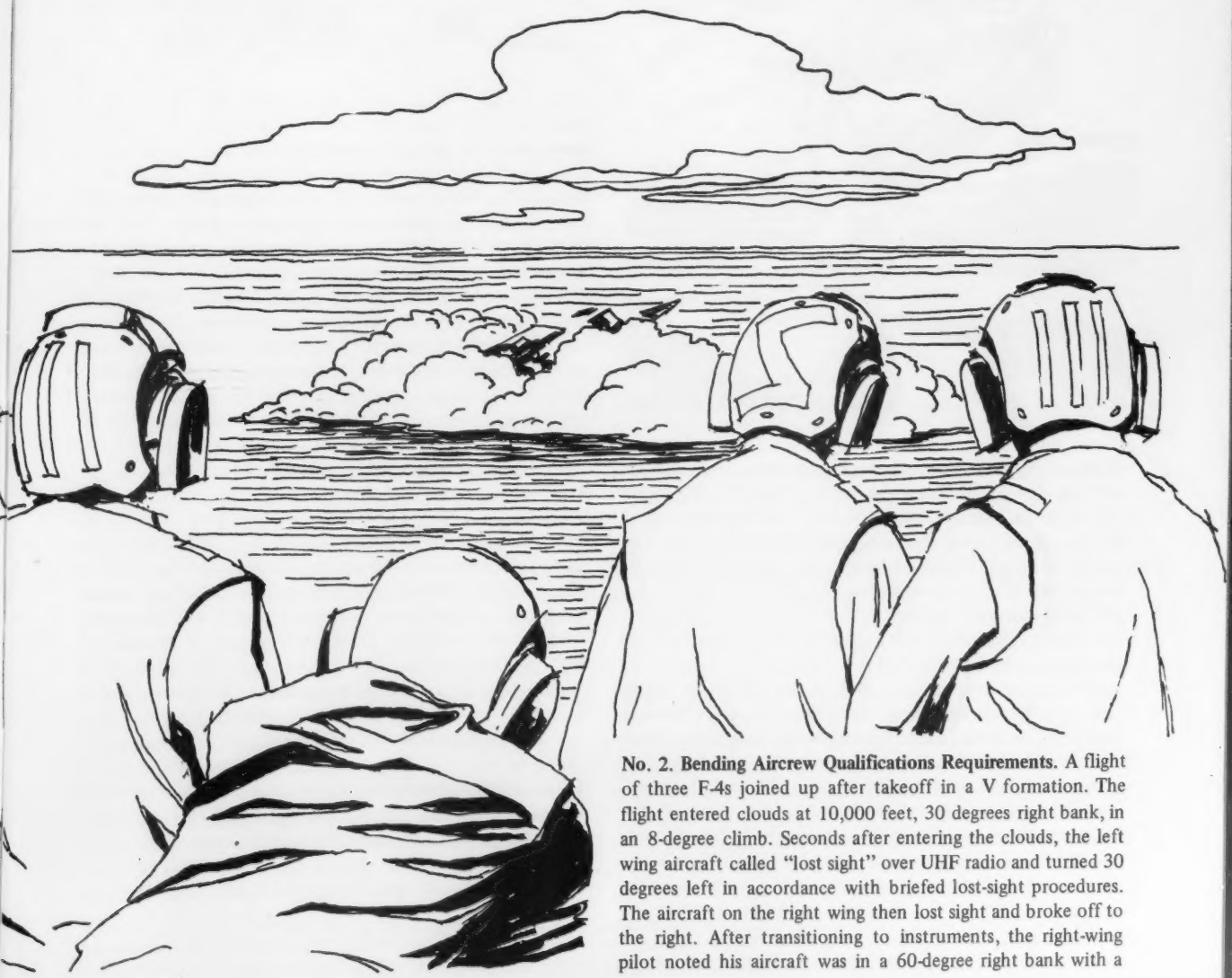
No. 1. One Costly Error. This squadron CO was on an "emotional high." His unit was about to celebrate multiple years and over 65,000 hours of mishap-free operations. He'd scheduled himself to fly the final flight, a CV flyby that had been authorized by the air boss. A large ceremony was waiting for him onboard the CV following his flight.

After launch, the skipper banked his aircraft left, completed a 180-degree turn, and headed downwind along the port bow of the carrier at approximately 300 feet AGL and 330 KIAS. Just abeam the island, the aircraft pitched up 10 to 20 degrees and began a climb and left roll into a 90-degree angle of bank. After holding in this position for 3 or 4 seconds, the roll continued to a level, inverted position. With the

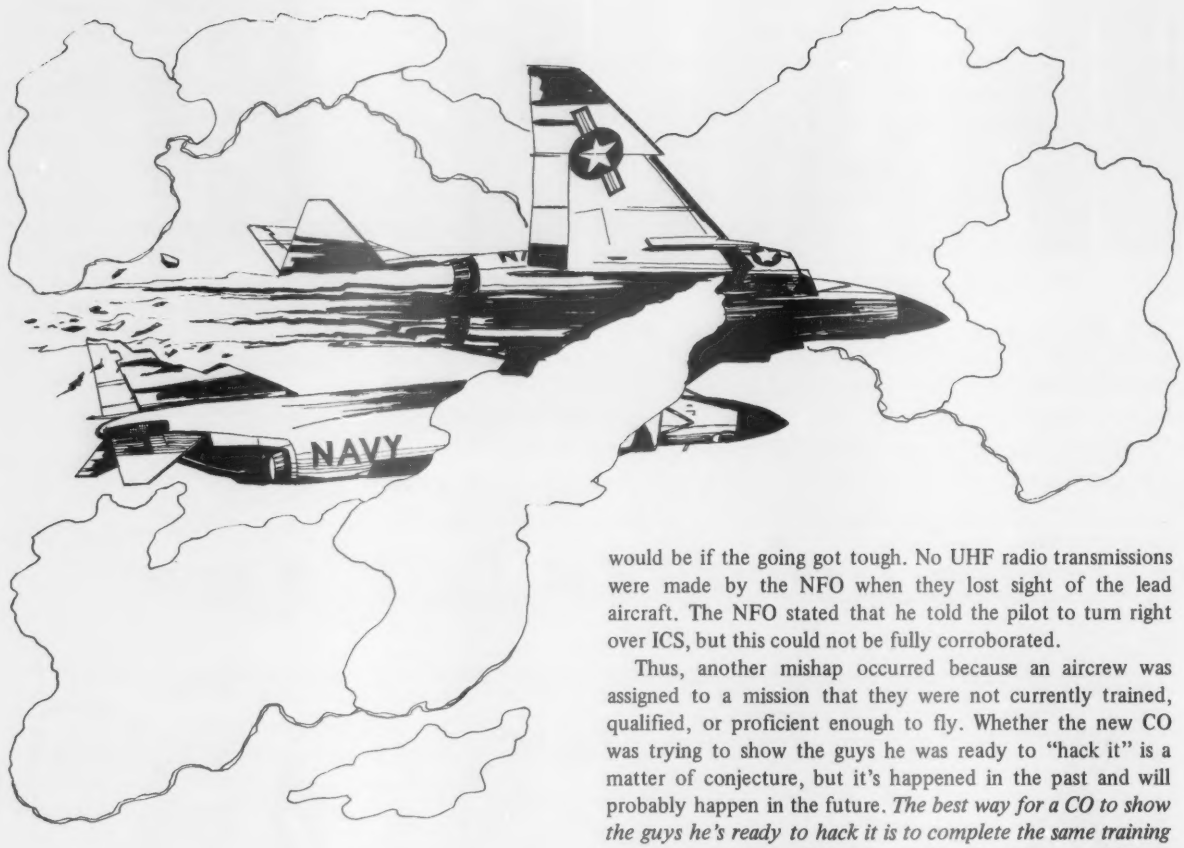
nose falling through the horizon, a rapid roll was completed to an upright, wings-level attitude, now 20 to 30 degrees nose low. As the nose scooped out in the last half of the roll, CV observers witnessed an abrupt pullup maneuver that brought the nose back up to 10 to 15 degrees below the horizon. Then it fell back to 20 degrees nose down, impacted the water, and exploded. The CO and his three crewmen were fatally injured. What happened?

Because of the pilot's conservative past performance, personal emphasis on safety, aversion to aerobatics, and leadership position as commanding officer, it's extremely unlikely that he deliberately intended to make a 360-degree roll. Chances are he allowed himself to become distracted while looking out the cockpit, probably at the CV, and inadvertently rolled into an excessive angle of bank at low altitude. When he realized he was in an *extremis* situation, his decision was to attempt to fly out of it by completing the roll.

Flybys have always been considered morale boosters for those who fix, launch, and recover aircraft and like to observe from the flight deck. With our increased emphasis on safety, flybys today are well regulated and required to conform to the provisions of General NATOPS (OPNAVINST 3710.7K), particularly as they apply to aerobatic flight below 1,500 feet in a control zone. This flyby, however, was outside the parameters of permissible aerobatic flight and led to a fatal mishap. One costly error turned what should have been a happy occasion into a tragedy.



No. 2. Bending Aircrew Qualifications Requirements. A flight of three F-4s joined up after takeoff in a V formation. The flight entered clouds at 10,000 feet, 30 degrees right bank, in an 8-degree climb. Seconds after entering the clouds, the left wing aircraft called "lost sight" over UHF radio and turned 30 degrees left in accordance with briefed lost-sight procedures. The aircraft on the right wing then lost sight and broke off to the right. After transitioning to instruments, the right-wing pilot noted his aircraft was in a 60-degree right bank with a



12-degree climb. Interpreting these indications as an unusual attitude, the pilot reduced the angle of bank to 10 degrees right bank and initiated a leveloff. Moments later, the nose of the F-4 flying right wing veered into the tail of the lead aircraft. The right-wing F-4 became uncontrollable, and fire was visible from both engines. The pilot then initiated a successful command ejection at 10,000 feet. The lead aircraft was able to return to home base and, despite substantial damage, land successfully.

The cause factors of this mishap were attributed to the pilot and NFO who ejected from the right-wing *Phantom*. Although both of these aviators were considered highly experienced, neither had flown much recently. The pilot had taken command of the squadron 2 weeks earlier, after having reported from a tour of shore duty. Neither was qualified to fly a formation flight with the strong possibility that IMC weather would be encountered. The lack of an effective crew brief prior to flight was indicative of how rusty these two would be if the going got tough. No UHF radio transmissions were made by the NFO when they lost sight of the lead aircraft. The NFO stated that he told the pilot to turn right over ICS, but this could not be fully corroborated.

Thus, another mishap occurred because an aircrew was assigned to a mission that they were not currently trained, qualified, or proficient enough to fly. Whether the new CO was trying to show the guys he was ready to "hack it" is a matter of conjecture, but it's happened in the past and will probably happen in the future. *The best way for a CO to show the guys he's ready to hack it is to complete the same training program as the rest of the pilots before he takes on a difficult flight.*

No. 3. The CO Didn't Set the Example. The following two aircraft mishaps occurred to the same squadron in a period of 4 days.

We'll address the first in capsule form. With their short deployment over, four H-53s in company with several H-1s departed USS GATOR on a flyaway to an MCAF. All aircraft arrived and landed safely. Because no room was left on the matting, the fourth *Sea Stallion* had to wait on the taxiway. With all H-53s still turning, the H-53 flight leader told No. 4 to taxi to a cement ramp. The pilots of No. 4 now saw an individual they thought was a taxi director. The copilot was so convinced that he said, "We have a taxi director." The mystery taxi director made gestures to the pilots and they thought he meant *taxi forward and make a left pedal-turn* (the crew chief later stated, "They didn't look like taxi directions to me"). The copilot next instructed the crew chief to clear the aircraft left and aft, and he responded with, "All clear." No right clearance was requested by pilots, so none was

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given. The pilot taxied 10 feet forward, commenced a left pedal-turn, and felt his main rotor blades shake hands with the main rotor blades of a nearby stationary H-53. Damage to both aircraft and some *Hueys* unlucky enough to be in the area was about $300,000. The mystery taxi director turned out to be an officer attached to another squadron. Where was the crew coordination? How did the pilots know they had a trained and qualified taxi director? Why did the HAC taxi without being sure he had sufficient clearance **in all directions?** Was get-home-itis a factor? We'll get to all these questions a little later.

Now let's look at the second mishap. Three days after returning from the shipboard deployment, the same *Sea Stallion* crews and the rest of the squadron departed for another MCAS to conduct special training. Several factors, which included the recent mishap, persistently long work hours, and a lowering of morale, had prompted the operations officer, safety director, and flight surgeon to advise against the deployment. After consulting with the group commander, however, the CO decided to proceed.

The night following arrival at the training MCAS, three crews were scheduled for a formation night navigation flight. Later, after switching copilots, glide-angle indicator light (GAIL) approaches were to be conducted at an auxiliary LZ. The CO was the flight leader. The mishap aircrew consisted of the HAC, copilot, crew chief, and a mech. The HAC was a newly-designated section leader with about 800 total hours. His copilot for the GAIL approaches was a more experienced pilot, who had over 1,400 flight-hours but had flown only 3.3 hours in the past 120 days and had no night time in over 5 months. He had just reported to the squadron following medical treatment and was a last-minute addition to the deployment.

The mishap HAC briefed the formation part of the flight. He appeared ill at ease and was corrected on several occasions by the flight leader (CO). The flight leader briefed the GAIL evolution. While listening, the aircrews felt some confusion over the planned conduct of GAIL approaches, including the functions of the LZ control officer, but nobody spoke up. Each aircrew discussed aircrew coordination individually. The mishap HAC, however, failed to brief waveoff procedures, rate of descent information, and clearance of aircraft during GAIL approaches.

The aircrews proceeded to maintenance control to sign for their aircraft. Even though there was a downing gripe (inoperative radar altimeter) in addition to an incomplete set of formation lights, the flight leader accepted his aircraft. From this point on, we'll refer to the flight leader's crew as No. 1, the mishap crew as No. 2, and the third crew as No. 3.

The three crews preflighted and then manned their H-53s. During start, No. 3 had mechanical problems, including an intermittent radar altimeter, and was instructed by the flight leader to take off late and rendezvous halfway through the navigation hop, which it did. The first portion of the flight proceeded with some difficulty. Number 2 missed its first checkpoint, No. 1 performed a "sloppy" lead change, and No. 3 had a tough time trying to keep No. 1 in sight due to No. 1's incomplete formation lights. Number 1 broke off early to return to base for refueling and to troubleshoot the radar altimeter. After this, the LZ control officer boarded the aircraft and No. 1 headed for the LZ area in company with No. 2. Both No. 2 and No. 3 had also returned to base to refuel. Because of a chip light, No. 3 cancelled the remainder of its mission.

5

Upon arrival at the LZ, No. 1 landed and offloaded the LZ control officer and the GAIL lights. The GAIL lights were then put in place and No. 1 made one approach to check the glide slope angle. Although required by squadron SOP, there were no two-way radio communications at the LZ. Number 2 then commenced the first of its two approaches with the copilot at the controls. The approach was too fast, and, at about 300 feet, the copilot pulled power and the HAC waved him off. On the second approach, the copilot was again fast, but both pilots stated later that the approach felt okay to them.

The copilot pulled power and was advised by the HAC that he was at 100 feet AGL and 30 KIAS. At 75 feet, the HAC noticed that the H-53 was in a 20- to 24-degree noseup attitude, but he thought the copilot would lower the nose and pull power. Instead, the copilot increased the noseup attitude,

the aircraft settled, and the tail skid hit the deck. When the HAC felt the initial impact, he took control and lowered the collective, but the aircraft smashed into the ground. There was extensive damage to the aircraft, but no one was injured.

The second mishap description should answer the questions we posed at the end of the first mishap. This CO was not setting the example by adhering to written regulations, including his own SOP. Having just had a costly aircraft mishap should have prompted him to ensure that future air operations would be by-the-book propositions. The first mishap occurred because there was a serious breakdown in crew coordination. Accepting taxi directions from an unknown, untrained, and unqualified taxi director, and then taxiing an H-53 without ensuring proper clearance on all sides, represents a definite lack of aircrew discipline. It's probable that the crew was hurrying to offload and get home. Does this or does this not reflect on command?

In the second mishap, several written regulations were violated in addition to the less-than-adequate briefings which preceded the flight. We'll review them below:

- An unqualified copilot was assigned to the mishap aircraft. He should have been allowed three night refresher flights prior to taking on such a demanding flight. This was SOP.
- The CO accepted an aircraft for flight with a downing discrepancy.
- Two-way radio communications between the aircraft and LZ control officer were not established. Although this had no bearing on the mishap, it indicates that the command didn't adhere to its own SOP.

When the CO fails to set the example, by not complying with proper training, operating, and safety procedures, he's opening the doors for his own personnel to emulate him. The two mishaps described above are vivid reminders of that.

After reviewing the above aircraft mishaps, we hope you'll feel that circumventing established training, operating, or safety procedures can and does lead to the unnecessary loss of our flight personnel and aircraft. Our main thrust in this article is to impress those who command that the buck stops with them. Their actions, both on the ground and in the air, are closely observed by their subordinates. Those who choose not to "go by the book" can expect that their personnel will follow.

In a peacetime environment, there can be no excuses offered by command that "pressure from the higher-ups" is responsible for deviations in normal operating procedures. Message traffic and correspondence from all levels of command indicate just the opposite. So, squadron COs, when your chain of command stresses flight and ground safety, take them at their word, because **they mean it!** Ensure the message is orally broadcast throughout the squadron, and back it up by posting this vital information on all your bulletin boards so those who toil for you will know exactly where you stand.

We know it's lonely at the top, but please make it safe. COs who operate thoughtfully, and insist that their personnel do the same, improve the lot of naval aviation. Those few who don't are spit shining the shoes of disaster.

Are you a *pigeon*, too?

By LT Bill Sullivan
HC-11

IT was a typical H-46 max pax and cargo mission to a carrier offshore in marginal VFR weather. We were still waiting for an overdue overhead message when we launched, so we had to rely on shore-based radar (voice call, "Plot") for the carrier position, but no problem – we had to get vectors around hot areas from Plot anyway.

So there we were, checking fuel consumption, logging vectors (in case we had to resort to the plotting board), establishing Bingo and our choices available, and soon it became apparent that Plot was so wrapped up with the fast movers that they forgot one H-46 chugging out to open sea. After the third time we pinged on Plot and received course changes of 60-120 degrees, we agreed that we were pretty much on our own out there. But why couldn't we pick up the carrier's TACAN? Then the UHF died. Now in the H-46, that single UHF is our one window to the world, and when it suddenly goes quiet in a busy place, you get to feeling like a toad in a roller rink. It's times like these that you're glad you made the copilot go back to the hangar to pick up the forgotten plotting board. All those training command and RAG habits of logging posits, times, and course/speed on your kneeboard can come in handy sometimes!

Lost comm without a TACAN generally leaves three choices: (1) reverse course and D/R the same route home (the long way around); (2) with a hot area chart and plotting board, plot the most direct route home that will avoid known (or all possible) hot areas; or (3) head toward nearest land VFR and hope somebody sees your lost comm squawk.

The point is, the H-46 is severely equipment-limited. With no radar and no backup nav or comm radios, pigeons, vectors, or changing mission requirements are not highly regarded by an H-46 pilot at sea. Certainly, everything's routine when the ships to be serviced are within visual range, but leaving the battle group cluster for a small boy 40 nm out on the screen can really be going out on a limb. If you go lost comm "out there" and then can't find the small boy (it doesn't have a TACAN), you're all set up for a ditching at sea, because you could run out of gas before finding Homeplate (would you believe some of the "Homeplate" ships don't have TACANs either?). Now you add that it's getting dark, and you're in the water, and you may have flown by Homeplate, looking for the battle group upsun in the evening haze (lost comm), and who would think to look for you on *this* side of Homeplate? Strike was too busy to flight-follow *you.* You certainly get to wondering why that small boy's mail couldn't have waited until he was closer, within visual or at least TACAN range of the battle group cluster.

Musing further, the root of the problem lies not in lack of sophisticated gadgetry in the H-46 or even in unreasonable tasking by the carrier. The problem of getting lost boils down to the pilot not being constantly aware of where he is with respect to Homeplate and vice versa. Undoubtedly the ship gave you *pigeons* – maybe Strike or Plot or somebody vectored you around a little, but ashore, would you let Center vector you into a mountain at night? It has happened. And the only way to prevent it is by you, the pilot, keeping constantly aware of where you are with respect to destination, obstacles (hot areas), and home.

Strike may be busy with the airshow and not tracking the ships, and the TACAN may or may not be available – yours or his could give up the ghost. What you're really relying on (at least initially, until you get a sweet lock) is *pigeons.*

Now *pigeons* are like gossip . . . and just about as credible. For one thing, the information is terribly dated – how old is that posit? Unless the ship is at anchor, you'll need TACAN or UHF (at least one) to find it. But then, consider who gave you those *pigeons* to begin with – has he ever been wrong before? You'd better believe it. And not just on routine missions, either. Once while flying VIPs around overseas, Departure gave me *pigeons* 90 degrees off-course and 240 miles away (three times my shore-to-ship range), then guessed a few more times before they approximated my TACAN lock at 32 miles. *Pigeons* were obviously more important to me than to them.

I agree, out at sea you've got to rely on *pigeons*; they really are the best thing going. But are you going to stake your life (and your crew's and passengers' lives) on someone else's *pigeons*? In an H-46 with no backup nav or comm radios? In marginal VFR overwater? When any of several emergencies would mean ditching long before nearing any rescue platforms?

Sure, you expect *pigeons* to be right – and well they should be when fliers' lives are at stake. But do you follow up with the plotting board or at least log en route vectors and posits for NORDO D/R nav? Are you aggressively using all your skills or just relying on *pigeons*? Are you still skeptical, or are you really comfortable just flying with the *pigeons*? Are you a pilot, or are you a *pigeon,* too? (Coo?)

A blue sky misunderstanding

By Richard A. Eldridge
APPROACH Writer

"MY decision was not whether to eject, but when. Somehow, I had to make my pilot aware of my intention.

"By leaning and pulling forward, I signaled over the left side of the DDD radar panel with a vigorous vertical motion of my right hand and arm in an attempt to convey my intention to go out the top. The pilot replied with an up and down shake of his head, which I perceived to be "yes." Still, I hesitated, unsure that he understood my meaning. Next I checked the COMMAND EJECT lever in the MCO position with my left hand and again signaled with a rapid up and down motion of my right fist. Seeing a vigorous up and down reply from the pilot, I returned my right hand to the lower ejection handle and initiated the ejection sequence."

It was all blue sky after that. The RIO had ejected himself and the pilot from an F-14 *Tomcat* that was suffering from several malfunctions in addition to a perceived electrical fire that was producing clouds of acrid fumes and smoke.

How they got here: Following a routine day flight from the carrier, the crew entered the break in preparation for recovery. At the break, the aircraft developed a whine. The crew believed the whine emanated from the environmental control system (ECS). Cockpit smoke coming from the ECS diffusers confirmed the ECS problem. When the pilot selected air source off, the noise and smoke ceased, but not for long. A much greater volume of smoke entered the cockpit from the vicinity of the RIO's ejection seat.

The pilot felt it was an electrical fire because of warning lights flashing erratically, inconsistent readings on the engine instruments, barberpoling of landing gear and flap indicators, and strange flight control inputs. Acting in accordance with NATOPS, he secured the left and right generators and, an instant later, the emergency generator. With this last action, the crew lost ICS communication.

Before securing the generators, the pilot had warned the RIO that they had some problems. This led the RIO to wonder how serious they were. Although it would have been great if the pilot had informed the RIO that he was securing the emergency generator so that he could expect loss of ICS, it must be remembered that the pilot's primary concern was to maintain control of the aircraft. After a few moments, when he felt he had the *Tomcat* under control, the pilot tried to communicate this to the RIO by removing his mask and shouting.

Meanwhile, the RIO had begun to taste and smell the unabated smoke and feel an increasing amount of heat. Deciding to eject, he attempted to convey this thought to the pilot. As we've said, neither the RIO nor the pilot were successful in conveying their intentions to each other. In retrospect, the entire hand signal sequence was misinterpreted in both cockpits. The pilot, who felt he had the aircraft under control, was starting a slow turn toward the CV with the intention of landing aboard. (He'd previously climbed out of the landing pattern when the *Tomcat* started to act up.)

Since there is no standard NATOPS hand signal in the F-14 community for ejection, the RIO devised his own. When the pilot responded twice with affirmative nods, the RIO took this to mean the pilot had agreed to eject.

Of course, the RIO cannot be faulted for his decision. He was literally in the "hot seat," and because of his *extremis* situation, he'd arrived at a deliberate decision to eject. His decision was also based upon their previously-agreed decision that if one felt it was time to go, they were both going to go.

When the RIO initiated command ejection, he used the lower ejection handle instead of the face curtain. At the time of ejection, the pilot had his visor up and his oxygen mask disconnected. The windblast was uncomfortable but not incapacitating. Although his helmet was secured by only the chinstrap, it stayed on his head and didn't rotate out of position. He'd purchased a form-fitting helmet with his own funds. It was later speculated that if the pilot's helmet had not been form-fitting, he'd have had an increased risk of sustaining head or neck injuries.

After the pilot got a good chute, he used the four-line release system to steer into the wind. The four-line release made turning the parachute simple and slowed the oscillations caused by raft deployment.

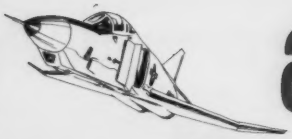
Both crewmen released themselves from their parachutes before water entry. Each gauged when to release his upper Koch fittings by watching the raft. When the raft hit the water, the RIO released his fittings. The pilot watched the lanyard attached to his raft and survival kit and released the fittings approximately 4 feet above the water. Both were successfully rescued by helo.

This mishap underlines the importance of intercockpit aircrew coordination and the dangers that come with breakdowns or misinterpretations. In dual-seat aircraft, the execution of any NATOPS procedure by one crewmember which restricts or prohibits the normal functions of another crewmember must be performed by mutual agreement when conditions dictate. In this case, the RIO did his best to receive the pilot's concurrence to eject, and to fault either individual for misinterpreting the improvised hand signals which resulted in the pilot's involuntary ejection would be unrealistic.

Because of the mishap, the following was incorporated as part of Interim Change 80 to the F-14 NATOPS Manual: "Prior to securing the emergency generator, the pilot should advise the RIO of his intentions and that normal cockpit communications will be lost."

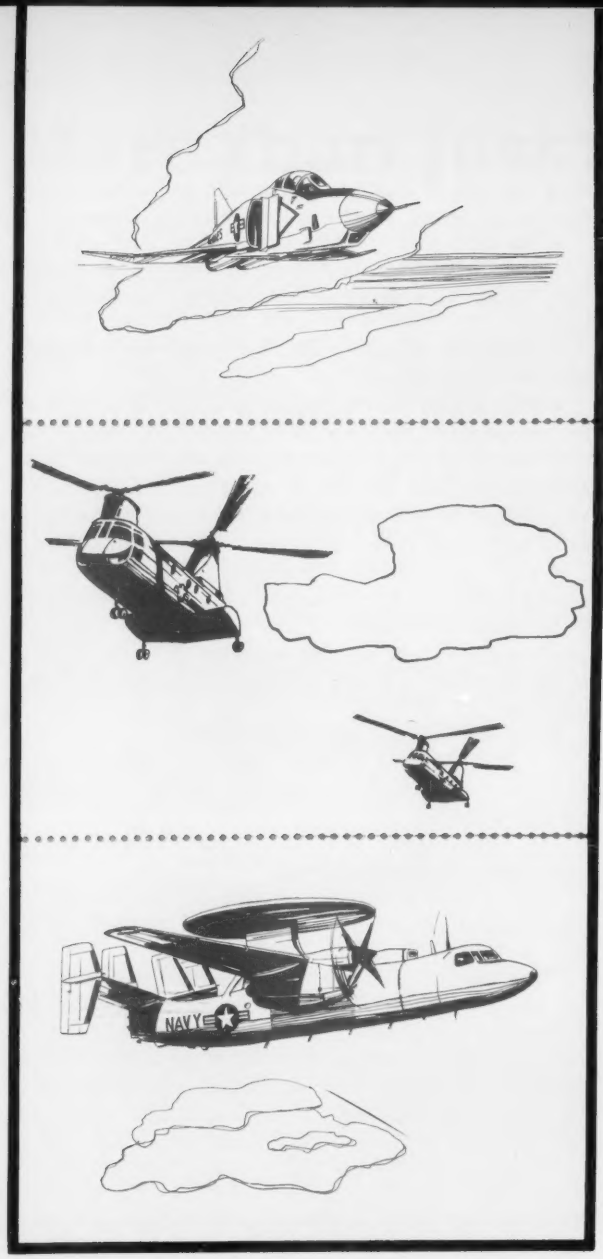
It is purely a matter of conjecture as to whether the pilot could have landed the stricken aircraft back aboard. During flight training, all naval aviators who fly in ejection seat aircraft are introduced to a philosophy regarding punch-out decisions. Moreover, specific attitudes regarding that philosophy are gained through association rather than through formal, structured training. Only the most exacting preflight agreements can help us reduce the possibilities of such dangerous inflight charades. And even then . . . ◄

We're all ferry pilots now



SINCE 1972, we at VRF-31 have been the Navy's only ferry activity, delivering aircraft worldwide to air stations and fleet units throughout Europe, the Caribbean, the Orient, and the United States under the control of a single scheduling office.

With the exception of the DC-9, TC-4C, and the F-18, we've ferried all the aircraft in the Navy and Marine Corps inventory. At last count, this was some 36 models and 102 series of aircraft. In order to ferry this number of aircraft (approximately 3,200 moves a year), VRF-31 has traditionally been assigned 50 pilots and NFOs and 40 enlisted aircrewmen, each multi-aircraft qualified. On the average, VRF-31 aviators and aircrewmen have maintained three to five different model



By LCDR Chip Mills
VRF-31

NATOPS qualifications while flying all the series for each model aircraft.

But that's all over now. By CNO decree, VRF-31 is no longer a flying squadron.

What does this mean to you? It means that, starting right now, you're all ferry pilots. Simply, the user is now responsible to ferry the aircraft he owns! VRF-31 will be providing the command and control for COMNAVAIRLANT, the CNO's executive agent for aircraft ferry moves.

With the help of the present OPNAVINST 3710.6G and proposed "H" version (Aircraft Ferry Instruction), let's look at how you'll fit into a typical ferry adventure. Say, for example, your squadron on the West Coast is preparing an aircraft for induction into SDLM (Scheduled Depot Level Maintenance) on the East Coast. When the aircraft is ready, your squadron will send the RFF (Ready For Ferry) message to VRF-31, identifying the aircraft to be moved and also the squadron ferry crew by name. Ready for takeoff? Not yet!

The aircraft can't be moved until VRF-31 sends an FMD (Ferry Movement Directive) message back to your command, followed by a phone call. This does two things: first, schedules officers at VRF-31 can look at the "big picture" and see how they can most economically get you home. More on this later. Second, VRF-31 has to assign the Tango numbers by name on the FMD message, which is necessary for you to have orders in hand prior to takeoff and to aid in processing and tracking the 6,000 travel claims submitted to VRF-31. After receipt of TEMADD claims, VRF-31 will verify the claims, submitting them to your local PSD (Personnel Support Detachment) for payment. Governing policy prohibits the NAS Norfolk PSD office that VRF-31 uses from acting on TEMADD claims for personnel outside the Norfolk local area. (No one said it would be easy – however, it can be a "piece of cake" if you know the procedures.)

Once you've departed on your journey across the country, you are under operational control of VRF-31 and can plan on remaining so for a maximum of 5 days if you're a jet pilot, 7 days if you fly prop aircraft, and 12 days if you fly helicopters. Why? This is the historical time it's taken to move across country and back by type. TEMADD money has *not* been provided to move crews back home commercially. Therefore, it's important that you call VRF-31 Schedules between each leg and let them know your aircraft status (up or down), your location, and your next destination.

With as many as 50 aircraft on the road on any given day, the situations that arise (down mech, family emergency, etc.) are many and varied, requiring tremendous coordination by VRF-31 Schedules. These phone calls become increasingly important as you get closer to your destination and are looking forward to getting back home.

While en route, the use of military facilities for fuel and quarters is required to the maximum extent possible. Non-availability endorsements are required on your orders when government quarters are not used at military fields. If your aircraft should go down mechanically en route, plan on staying with the aircraft until it's repaired or you can be moved via government air transportation, whichever is most cost-effective. Commercial air transportation is a very last resort – don't hold your breath while counting on it (reservists take note).

Continued

Upon reaching your destination and delivering your aircraft, several possibilities exist as to what you'll do next. The ideal situation would be to have one of your squadron's aircraft come out of rework just as you arrive, giving you a round trip home and that much more flight time. The second best plan is to find some government air, such as a C-9, leaving shortly after your arrival and flying directly to your home base. These two situations are what VRF-31 Schedules will be striving for. That's why you are not to depart NAS Homebase before the FMD message is received by your command and the go-ahead to launch is confirmed by phone.

It's quite possible that there will be no government transportation available for an immediate return. In fact, you might be required to wait up to 3 days. Once again, commercial air transportation will be an absolute last resort to get you home (TEMADD budgets are bare).

Another possibility is arriving at destination and being assigned an aircraft ready for ferry that you are qualified to fly but does not belong to your command. You are under the operational control of VRF-31 for the number of days mentioned earlier and will probably be tasked to move the aircraft. A plausible scenario might look like this for an F-4 pilot. A Marine pilot (F-4s are ferried solo IAW OPNAVINST 3710.6 series – check the instruction for the number of crewmembers in your type aircraft) ferries an F-4 from MCAS El Toro to Birmingham, Alabama for an overhaul. At Birmingham, there is an F-4 just out of overhaul ready to go to the Navy Reserves at NAS Dallas. He ferries the F-4 to Dallas and sits for a day waiting for a Navy C-9 to take him to North Island and government transportation (C-12, truck, etc.) to take him back to El Toro.

This tasking of aircrews to fly other commands' aircraft is necessary in order to ferry aircraft as economically as possible. The merits of this system vary through the eyes of the beholder. Approximately 13,000 man-days are needed to accomplish 3,200 moves. To the young, aspiring aviator, this is a great opportunity to see the country and build flight time. To the family man just back from a 6-month deployment, this means more separation, of which there is already too much. To your operations officer, this means the temporary loss of a valuable crew from his flight schedule. To your safety officer and commanding officer, this has a double meaning. First, the crew will be operating in a hazardous regime, i.e., away from home. (During the first 17 days of June, AIRPAC experienced 8 mishaps: 4 on the road, 2 on cross-countries, and 2 on detachments.) Working for VRF-31, your aircrews will be a cross-country detachment. The second concern is that in the proposed OPNAVINST 3710.6H (ferry instruction), in the event of an aircraft mishap, the reporting and investigating responsibilities will remain with the reporting custodian of the aircraft.

To aid you as a fleet ferry pilot, the following tips appear for your benefit. They originally appeared in CDR Billy Carroll's article, "You Can Fly Them All Safely," in the SEPT '63 *APPROACH* and resurfaced in the MAY '80 *APPROACH* in LT Steve Duffy's article, "Ready for Ferry?"

- Aircraft material condition runs the gamut from brand new to safe for one-time ferry flight. Be prepared for anything.
- The very nature of ferrying requires that practically every hop end at a different field, with its peculiar traffic patterns and layout. Careful preflight planning is imperative.
- The ferry pilot is seldom able to use his own squadron personnel for servicing, preflighting, or repairing an aircraft being ferried. Keep an eye on that "qualified" transient lineman.

In "Ferrying Aircraft" (JUL '71), LCDR Art Friedman warns of several gotchas:

- When a ferry pilot is assigned an aircraft to move, it is his responsibility to ensure a safe and expeditious delivery. He must be his own operations officer, NATOPS officer, and maintenance officer. He must be thoroughly conversant with all applicable OPNAV and NAVAIR instructions, and he *must know* his aircraft. (Guess who's also his own safety officer.)
- Most organizations, when transferring an aircraft, will expend as little money and manpower as possible in preparing it for flight. OPNAVINST 3710.6 plainly states the ferry pilot's responsibilities and his authority to accept or not accept an aircraft if it does not conform with the applicable directives.
- Know at least the following instructions:

a. The proposed 3710.6H, encl. (8): Ferry Enroute Procedures. It contains everything you need to know about the ferry business.

b. OPNAVINST 3710.7K – NATOPS General Flight and Operating Instructions Manual.

- Know *how* to read aircraft logs, and then *read them.* Don't transfer one squadron's problem (seat cartridges out of date, for example) to another.

Operations and maintenance officers, when you are selecting your crews to deliver and pick up aircraft, you may be tempted to send a junior aviator in order to give him experience. Consider the material condition of the aircraft and the distance to be traveled. If the aircraft goes down mechanically en route, more than likely, your maintenance technicians will be tasked to fix it. If your junior aviator has to pick up a bird from an overhaul facility, he may balk at the three-or-more-page NBNC (Noted But Not Corrected) list of discrepancies that are not in the contract to fix and not exactly safety-of-flight items. On the other hand, if you elect to send LT Ace Functional Checkpilot, brief him on the overhaul contract requirements. It will save him and the overhaul facility a lot of consternation and frustration if he has an idea as to what they are required to fix and what they are not (functional wings should have the information). ***They are required to fix any safety of flight item!***

October 1, 1982 will signal the end of an era. Despite the insidious hazards and hassles, the ferry mission and the flying were loved by every pilot, NFO, and aircrewman in VRF-31. That was why we were here. Our theme song was, "On the Road Again," our mission was "Truckin' Trail," and our motto was "Stayin' Alive."

The "Storkliners" of VRF-31 hope you enjoy the ferry mission as much as we have. If it should turn out you do not, we'll be around to take it back. ◄

More than just a good idea

By LT Patrick Sherman
VP-11

ON the morning of 1 December 1974, Flight 514 was flying an instrument approach to Dulles Airport outside Washington, DC. Due to the flightcrew's misinterpretation of the approach plate and their perception of air traffic control procedures that differed from that held by the controller working the flight, the crew descended below the minimum safe altitude for the area and flew into a mountain.

Six weeks earlier, a different liner operating in the same area and executing the same approach had narrowly escaped the same fate. The crew of this flight had reported the incident under a company program that had been instituted in January 1974, and their report had been forwarded to the FAA in Washington. Unfortunately, this information, which could have prevented the mountain crash, was sleeping in an "in" basket at the FAA because there was no established method of spreading the word.

These two incidents provided the catalyst for action. Prompted by the National Transportation Safety Board's comments in the wake of the mountain disaster, as well as by other factors, the FAA established the Aviation Safety Reporting Program in May 1975. In spite of promises of anonymity and immunity for reporters under the program, however, the fact that the FAA (which formulates and enforces aviation regulations) administered the program acted as a major deterrent to potential reporters, and the program was less than successful. Later, in conjunction with the National Aeronautics and Space Administration, the FAA instituted a program of safety reporting in which NASA served as a third party to receive and analyze reports. The Aviation Safety Reporting System (ASRS) was thus established in April 1976 and is available for our use today.

Under the ASRS, pilots, controllers, and other individuals involved in the use and operation of the national airspace system are encouraged to report discrepancies and deficiencies involving the safety of aviation operations. According to FAA Advisory Circular 00-46B (15 June 79), which details operation of the ASRS, items covered by the program include "departure, en route, approach, and landing operations and procedures, air traffic control procedures and equipment, pilot and controller communications, aircraft movement on the airport, and near-midair collisions." Obviously, virtually any incident related to flight safety is reportable.

As noted previously, all reports are sent directly to NASA, which ensures the reporter's anonymity and immunity in the following manner. Each report form contains a tear-off stub for the reporter's name and address, which will be used by NASA to contact the individual should further clarification of the report's contents be required before processing. After this, the ID stub, having been stamped with the date of receipt, is removed and returned to the sender. The report is then processed without any information which could identify the reporting party. In addition, Section 91.57 of the Federal Aviation Regulations prohibits the use of any report submitted to NASA under the ASRS in any disciplinary action, except in the case of criminal offenses or accidents. In these cases, the reports will be forwarded by NASA to the Department of Justice, FAA, or NTSB as appropriate.

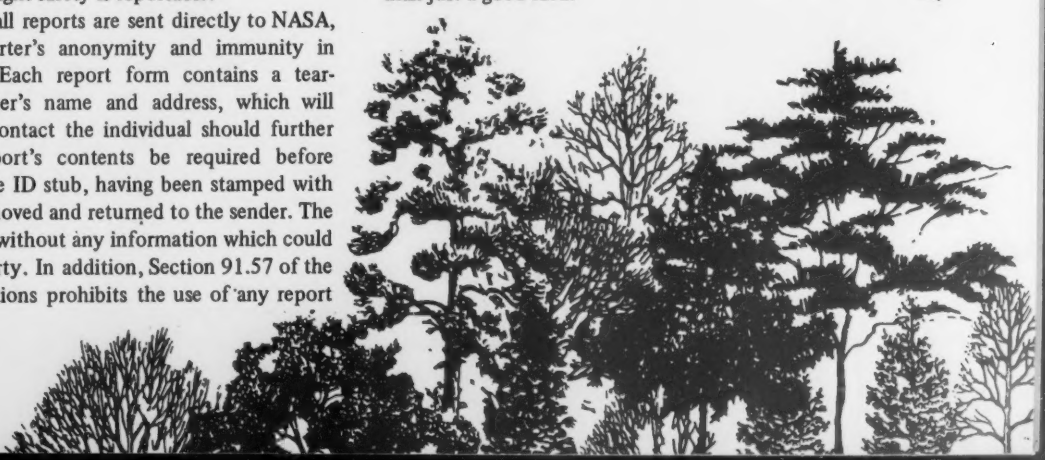
A special provision of the system is one in which a report indicates an inadvertent violation of Federal Aviation Regulations. In this instance, even though a violation has occurred, the FAA will not take disciplinary action against the reporter, provided (1) the violation did not involve a criminal offense, and (2) the individual has not had any previous violations since the establishment of the program. In addition, the report must have been submitted within 10 days after the incident; the ID stub that NASA returns to the reporter serves as proof of having met this requirement. In other words, a report to ASRS could well save a flight violation.

To date, well over 30,000 reports have been received and the information has been used to alleviate and prevent deficiencies in all areas of aviation safety. An added benefit of the ASRS is a monthly newsletter, *CALLBACK*, which contains report excerpts, information on improvements to the national airspace system resulting from reports received, and updates on the ASRS itself. *CALLBACK* is most informative, often entertaining, and available free of charge to anyone interested in subscribing. Multiple copies are available for distribution throughout your command.

For subscriptions to *CALLBACK*, contact Mr. Rex Hardy, NASA-ASRS, Box 189, Moffett Field, CA 94035.

Reporting forms – NASA ARC Form 277 (revised June 1979) – are available in limited quantities from all FAA offices, including flight service stations. Commands may obtain forms in quantity by submitting requests to the Department of Transportation, Federal Aviation Administration, Aeronautical Center, Distribution Section, AAC-45C, Box 25082, Oklahoma City, OK 73125.

Due to the volume of Navy and Marine Corps operations and the broad geographical areas they cover, we are in a unique position to improve the system within which we operate by contributing to a quality program such as ASRS. And as individuals, we have the responsibility to report deficiencies in order to make the system safer for ourselves and those with whom we share it. In that sense, it's more than just a good idea!



Lip Service to Crew Rest

THE P-3 NATOPS Manual states that 15 hours of crew rest is required between postflight and preflight for all flights scheduled in excess of 6 hours duration. On paper that sounds and looks great, and appears to allow for an adequate amount of rest, given those conditions. In our squadron, however, there is a wide divergence between what NATOPS says crew rest shall be and "what it really is."

Recently, a training flight was scheduled to go to Adak, Alaska with a planned en route time of 6 hours and 20 minutes. No problem, except that the two flight engineers (FEs) who were scheduled for the 0730 preflight did not finish their previous day's postflight until after 2300. That meant that their crew rest time would amount to only 8½ hours. Additionally, their crew duty time on the previous day amounted to about 16 hours.

When this fact was pointed out to the safety officer by the FEs, his comment was, "Well, it's too late to do anything about it now." The operations officer's comment was that they would fly the flight. The XO was a little more expressive in his remark: "The book is only a guide, and I'll do as I see fit."

The PPC of the flight on which the two FEs had put in a 16-hour day was also scheduled for the flight to Adak. His preflight time was 0600 – 7 hours crew rest between flights. His scheduled flight was an 8-hour transpac, and he went.

We used the chain of command to bring the crew rest situation to the attention of the "heavies." However, the CO, XO, ops officer, and safety officer saw no conflict in flying the flights as scheduled, even though alternate crews were available.

Just recently we had a safety stand-down and our XO talked about preventing mishaps. Yet he allows this complacent attitude toward crew rest to continue because "We need the hours, and it will look good to the wing."

If we continue on this path, we will lose a P-3. We throw away the book when it doesn't fit our needs.

Disgruntledmouse

Three separate Anymouse reports were received on this incident. – Ed.

The PPC Is Responsible

A P-3 crew arrived in the terminal area with less than the minimum on-top fuel requirement – 5,000 pounds instead of the 6.000 pounds required. It was still enough for 2 hours of flying.

When the gear handle was lowered, the nose gear would not indicate down and locked. NATOPS emergency procedures were followed, but the nose gear could not be lowered to the down and locked position. During a tower fly-by for a gear check, the nose gear suddenly indicated down and locked, so the pilots decided to land on that approach.

On a very short final, the PPC, who was occupying the copilot's seat, decided the landing touchdown would be too long and ordered, "Take it around." However, the pilot at the controls responded, "I can make it," and landed the P-3, pushed the yoke forward, and used max reverse and heavy braking to stay on the runway. While taxiing in, the nose gear was noted to be shimmying. Later, an investigation showed the nose strut to be bottomed out and damaged.

The left seat pilot explained that he didn't want to make another approach because he had less fuel than the required amount.

This was a classic example of creating urgency when there really was no urgency and begs the question, "What does an order from the pilot in command mean?"

Urgentmouse

The PPC said, "Take it around!"

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

ANYMOUSE

If the pilot at the controls doesn't respond in the proper manner, the next response by the PPC should have been, "I have control of the aircraft." The PPC was right in his analysis of the situation, but he failed to follow through after giving the order to take it around.

F-14 Fuel Totalizer Problem

THIS Anymouse is submitted with the knowledge of the CO in the hope that the lessons learned by this squadron might help other units. The hazard report submitted by the flightcrew read like this: "The F-14 had a history of fuel quantity errors on the high side. On the first incident, we were engaged in ACM and knocked off the engagement with 2,800 pounds on the fuel totalizer. Planned Bingo was 3,000 pounds and had been placed in the Bingo counter. The NATOPS sea level fuel was 2,300 pounds in order to have the minimum required 2,000 pounds of fuel on deck. The MASTER CAUTION light flashed, the Bingo light illuminated, and the pilot began recovering from a nose-low inverted attitude at 16,000 feet. He checked the fuel feeds and tapes. Both tapes indicated zero. The left feed counter showed 300 pounds remaining; the right feed indicated 500 pounds. The pilot pulled the throttles to IDLE, commenced a zoom climb, and turned toward NAS Stopover, 25 miles away. We declared an emergency and started a max range idle descent. Knowing the notorious inaccuracies of fuel gauges, we looked for and found a suitable highway to land on in case our fuel ran out before we reached the Bingo field. Fuel quantity in the feeds came up to approximately 600 pounds on each side, with the totalizer still showing 2,800 pounds. We continued our descent and landed uneventfully at NAS Stopover. In the chocks our gauge showed the fuel onboard to be 1,100 pounds."

Because this crew was a one-plane detachment (out and in), they did not down the aircraft. The incident report continues: "On the second incident (same day, same aircraft) during ACM, the pilot checked the fuel totalizer at 5,800 pounds. Cross-checking the tapes showed 2,800 pounds on the left tape and 1,000 pounds on the right tape. ACM was terminated due to the fuel split. At that time the left fuel low light illuminated with 900 pounds indicating on the left feed and 1,400 pounds on the right feed. We again declared an emergency and headed toward Homeplate. As the F-14 steadied out, the fuel totalizer climbed to 19,700 pounds, with 1,400 pounds on each feed and tape. We cancelled the emergency and continued on to Homeplate, landing with 2,400 pounds remaining. Upon refueling, the totalizer went up to 22,700 pounds."

The aircraft was downed and subsequently repaired. Both incidents were written up. Two days later, the aircraft again had fuel totalizer problems. This time, during flight, the totalizer indicated 22,700 pounds of fuel until the actual fuel remaining was 11,000 pounds and then indicated accurately. Again the aircraft was downed and an investigation was begun. At this point the above narrative surfaced and the following points were brought out:

- It was "common knowledge" among a number of flightcrews that this aircraft had a history of fuel totalizer indicating problems.
- In the previous 62 days, this aircraft had 11 gripes on the fuel totalizer. This trend went undiscovered by both maintenance control and quality assurance. The two hazard reports brought it to light.
- The F-14 Mission Essential Equipment Matrix (OPNAVINST 5442.4F) carries the fuel totalizer as an up gripe.
- Even though the RAG and the F-14 NATOPS emphasize the fact that the Bingo light gets its indication directly from the fuel totalizer, it is not unusual for a crew to set a Bingo figure in the counter and allow the illumination of the Bingo light to key them to a low state. Usually fuel tape and feed quantities are cross-checked with the totalizer. However, during ACM, when instrument scan is degraded, crews rely heavily on the fuel totalizer and the Bingo light.
- There's a silver lining to this cloud. We're glad that the climate in the squadron was such that the incidents did get reported. Because of this, we're able to share our discoveries with the rest of the F-14 community right now.

This aircraft was finally properly repaired, aircrews were reeducated on the F-14 fuel system, and internal problem areas in QA were rectified. Most important, these experiences were passed on, and again the value of Anymouse is underscored.

Totalizerconfusedmouse

A RECENT wake turbulence incident involving a C-12 and a P-3 gives us a good reason to warn of the dangers that lurk within this invisible force, especially for light aircraft at low altitude. Here's what happened:

The C-12 was on short final for landing on NAS East, Runway 27. Winds were calm to light. The aircraft was at full flaps, 105 KIAS, and 150 feet AGL, 300 feet from the threshold. Suddenly, it ran into severe wake turbulence from a preceding P-3 that had left a wavering memory during touch-and-go landings. The C-12 rolled rapidly to the right for 30 to 40 degrees and entered a high sink rate. The pilots immediately added full power, full left aileron, and left rudder. Just to the right of the runway, at 50 feet AGL, the aircraft rolled wings level with the sink rate arrested. An uneventful landing followed.

The aircraft commander's immediate response and proper assessment of this wake turbulence episode no doubt saved his aircraft, crew, and passengers from a tragic mishap. But was the aircraft commander alert to the potentially hazardous air currents? He should have been – the cues were there. The winds were reported calm and a larger aircraft was bouncing. When encountered at low altitude on approach, turbu-

The invisible force strikes again!

By Russ Forbush
APPROACH Writer

lence is abrupt and alarming. If you should always be warned about wake turbulence, who should warn you?

How many of us rely on cautionary wake turbulence advisories by tower personnel to alert us to the hazard? If you do, you don't appreciate or understand the problem. Tower personnel are only required to provide cautionary advisories when you're landing, taking off, or crossing behind **heavy** jet aircraft (300,000 pounds or greater in gross weight). **There are precious few aircraft in this class;** you hear their call-signs ending with the word "heavy." The P-3 is listed as "large" (12,500 to 300,000 pounds) and the C-12 as "small" (12,500 and under). In specific cases not involving a designated **heavy** ahead of you, cautionary advisories are issued to any aircraft which, in the controller's *opinion,* may be adversely affected by *potential* wake turbulence. Opinion implies discretionary vice required reports. Potential denotes assessment of conditions and capabilities. Both are tied to knowledge and understanding which may exceed an individual controller's capacity. You, as the pilot, are best able to assess factors affecting your aircraft, but you have to be aware and alert.

Be aware of the factors which cause wake turbulence to be a hazard. ASOs would do their squadrons a service by giving an AOM briefing on this and an earlier *APPROACH* article (JUN '81), "The Invisible Force" – an in-depth look at wake turbulence.

Be aware of the separation and reporting criteria used by controllers. ASOs, here's more grist for your AOM. The time-and-distance separations used by controllers are the same standoffs that a pilot should consider. The Department of Transportation Air Traffic Control Manual No. 7110.65C (Section 1110 and Chapter 6) can be obtained from the air operations department on your station or aboard your ship. It is concise and liberally illustrated.

Be alert to the hazard. Study that airfield depiction. Listen to the reported winds (a crosswind can turn into a corkscrew). If the other landing pattern traffic isn't reported, ask for it.

As the ATC Manual states, "Wake turbulence may be encountered by aircraft in flight as well as when operating on the airport movement area." The JUN '81 *APPROACH* article was prompted by an incident between two F-4s. This article was prompted by a C-12 following a P-3. The point is that you don't have to be following a designated heavy to get caught by the invisible force. **The hidden danger is that wake turbulence cautionary advisories are only required when a heavy is ahead of you, but the force is behind every aircraft.**

With all that has been written and spoken about wake turbulence, it's evident that the majority of our pilots are still not fully aware of its potential. Don't wait until a major mishap occurs before taking action – do it now!

F/A-18 EJECTION

chute contributes to pilot's injuries!

By R. A. Eldridge
APPROACH Writer

1709:19 *Tower – Alfa Bravo 12, taxi into position and hold.*
1709:20 *Pilot – 12, position and hold.*
1710:00 *Controller – Alfa Bravo 12, after departure, make an immediate left turn and climb VFR on a heading of 160 degrees. Report leaving 7,000 feet. When leaving the airport traffic area, change to departure control. Wind is calm, cleared for takeoff.*
1711:00 *Pilot – Roger, 160, 7,000 feet.*
1714:04 *Controller – Alfa Bravo 12, Tower.*
1714:06 *Pilot – Go ahead.*
1714:10 *Controller – We have a report that you apparently lost your starboard tire.*
1714:14 *Pilot – Oh no, you're kidding!*
1714:16 *Controller – Would you like to come back and make a low pass for a visual check?*
1714:18 *Pilot – That's affirmative.*
1714:19 *Controller – Roger, turn inbound for a low approach over Runway 32.*
1714:21 *Pilot – Roger.*
1716:08 *Controller – Alfa Bravo 12, your right tire does not appear to be on.*
1716:12 *Pilot – Okay, I've got a mainmount, a left mainmount, and a starboard tire that is gone?*
1716:18 *Controller – Negative, you have a starboard mainmount that is gone; you appear to have a nosewheel and a left mainmount on.*
1716:25 *Pilot – Okay, I've got a left mainmount and a nosewheel. I've got a negative starboard mainmount, right?*
1716:32 *Tower – Alfa Bravo 12, affirmative, you do not appear to have a starboard mainmount.*
1716:36 *Pilot – Thank you.*
1716:42 *Controller – Alfa Bravo 12, we'll be standing by for your intentions.*
1716:46 *Pilot – Roger, I'll stand by and look at the book here. I just may proceed back to my home base.*
1716:51 *Tower – Roger.*

THESE UHF transmissions took place just after the pilot of an F/A-18 took off on his third familiarization flight in the aircraft. After analyzing the situation, he decided to return to his home field (a little over 100 miles away), retracted the gear, and declared an emergency.

Next, his CO was informed of the situation, and following a discussion with a technical representative, someone picked up a phone and dialed NATC Patuxent River. It seems a similar incident had occurred previously at NATC and a successful field arrestment had been made. After all options were discussed, the pilot was told that a short-field arrested landing would be his best bet.

The *Hornet* flier was worried about snagging the arresting wire with the right main landing gear stub. Although this was recognized as a risk, a short-field arrested landing was considered the best method of recovery ashore. It was also recommended to the pilot that he make a low-sink-rate arrested landing. At the time, the wind was gusting to 26 knots from slightly left of runway heading.

An LSO was on station to help with the approach because the mirror was not set up for an approach into the arresting gear. Two practice approaches were made, with the third one planned for the arrestment. On the third approach, the hook touched down about 10 feet past the wire and the pilot executed a successful go-around.

On the next approach the F/A-18 touched down short of the wire and engaged the wire with the right main landing gear stub. This action yawed the aircraft violently 90 degrees to the right while simultaneously causing the aircraft to roll rapidly to a 23-degree left-wing-down attitude before returning abruptly to an upright attitude.

As the *Hornet* started to roll, the pilot initiated ejection with the lower handle because he felt the aircraft was about to roll over. The ejection sequence functioned normally, with seat/man separation at the apex of the trajectory (118 feet AGL).

The pilot had a full chute in a steady-state descent at approximately 52 feet AGL with no chute oscillations observed. *He had 5 seconds from chute opening until impact.* Impact was extremely hard and negated the pilot's intention to roll in the direction of landing on contact with the ground. With his chute billowing in a 20-knot wind, he was dragged approximately 75 feet before someone collapsed his chute. The pilot suffered a dislocated right hip on landing.

The GQ-1,000 aeroconical parachute contributed to the pilot's injuries. Military specification criteria for aircrew egress systems require that the system be capable of returning the aircrewman to earth or water in a condition able to execute the tasks associated with survival or enemy evasion. The vertical component shall not exceed 24 feet per second under ICAO standard day conditions. Total vertical component shall not exceed 30 feet per second. Ground impact in this mishap was 58 feet per second. MIL-S-18471 F(AS) refers.

As a result of an engineering investigation conducted on the failed main landing gear wheel assembly, it was agreed that the cause and progression of failure sequence was as follows:

- The axle retaining nut locking bolt rotated off, or the locking bolt nut was not installed, or the locking bolt/nut was overtorqued (exact cause not specified) and resulted in bolt failure.
- The axle retaining nut rotated approximately eight turns.
- The resultant looseness caused eventual bearing integrity loss, breakup, and outboard wheel assembly failure.
- The outboard wheel assembly then rode over the axle retaining nut and fell from the aircraft after takeoff.

As a result of the mishap, COMNAVAIRSYSCOM issued ECP 86, specifying that the existing locking bolt and nut be replaced with a cotter-keyed locking bolt and a steel nut. The ECP affects aircraft F-21 and up for the bolt and F-63 and up for the steel nut.

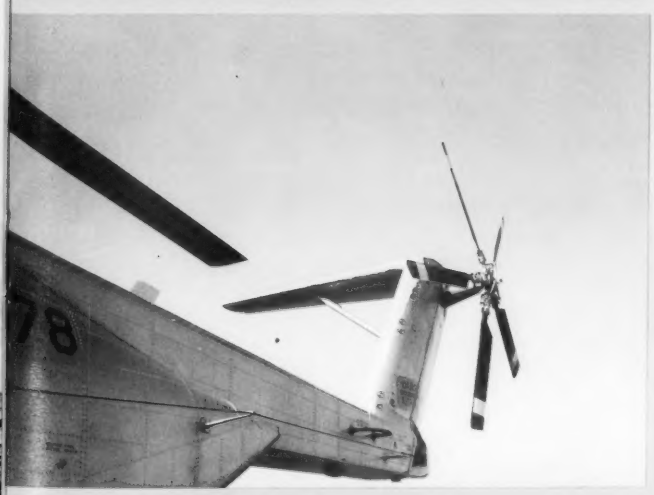
The GQ-1,000 parachute will be replaced by the AIM parachute, with additional egress system improvements.

A newly-incorporated NATOPS change recommends a normal landing rollout when landing ashore with a missing wheel or main landing gear stub. ◄

Helicopter inflight icing

By Arthur J. Negrette

HOW should helicopter pilots treat the icing environment? Some will respond to this query by emphasizing the many hazards and uncertainties associated with helicopter inflight icing. Others, more casually, may reflect upon prior fixed-wing icing experience and conclude that icing, unless severe and extensive, is not a restriction to helicopter operations. Still others will perceive inflight icing to be a problem only in the operational sense, i.e., the freezing of windshields, without associating the consequences of inflight icing to flight safety.



As the demand for helicopter IFR operations has grown in response to military requirements, inflight helicopter icing has increasingly been identified as a major limitation. Today, military units routinely undertake helicopter IFR operations. No longer is the old "AVOID VISIBLE PRECIPITATION" rule of thumb viable or adequate for dealing with helicopter icing.

Concern over helicopter operations in the icing environment is not without justification. In the early and mid-1970's, research conducted by the U.S. Army and other government agencies disclosed the unique and dangerous effects of rotor blade icing. During these tests, the helicopter's autorotational characteristics deteriorated significantly when only a small amount of ice accumulated on the rotor blade's leading edge.

Further research and field operations have raised still other concerns relating to helicopter operations in the icing environment and include:

- Ice-induced engine failures.
- Asymmetrical shedding of main rotor and tail rotor icing with associated vibrations.
- Increased power requirements due to additional drag of the rotor system.
- Hazards to life and property from shedding rotor blade ice.
- Operational penalties associated with inflight helicopter icing, i.e., restricted airspeed, premature blade stall, and significantly reduced range and endurance.

Ice-Induced Engine Failures. Field reports from military operators have repeatedly verified the susceptibility of helicopter turbine engines to inflight icing. In 1977, the Navy reported several helicopter mishaps and incidents involving ice-induced engine failures. On one occasion, a CH-46 helicopter on a cross-country flight to the San Francisco Bay area was operating in instrument meteorological conditions (IMC) and experienced a dual-engine flameout because engine screens were installed on both engines.

Yet another incident involved a Navy H-2 helicopter on a night flight in IMC over mountainous terrain. While climbing to a higher altitude, icing was encountered (neither forecast nor anticipated), causing severe vibrations and the loss of both turbine engines, resulting in the necessity for a night autorotation on instruments over mountainous terrain. Subsequently, the H-2 broke out and the pilot located a lighted civil airport and landed, despite the loss of both engines.

Another Navy CH-46 was lost due to ice-induced engine failures while flying at 3,000 feet in IMC and below the freezing level only minutes after liftoff. Shortly after takeoff, ice was noticed forming on the windscreen and over the engine screens. Despite the pilot's immediate action to initiate an emergency descent, a dual-engine flameout was experienced, requiring an autorotation and water ditching, after which the helicopter sank. The flight from takeoff to ditching consumed less than 13 minutes, illustrating dramatically the disastrous effects of inflight icing on helicopter engine air screens.

More recently, a U.S. Air Force HH-3 crashed in Iceland and was destroyed when one of its two turbine engines failed

due to the internal failing, or malfunctioning, of a pressure valve in the engine anti-icing system used to channel heated air from the engine compressor over the inlet guide vanes and struts of the front frames of each engine.

Failure of the pressure valve does not activate any cockpit annunciator light or instrument to alert the pilot of an unreliable engine anti-icing system. Consequently, the crew initiated a takeoff, and the engine with a malfunctioning anti-icing system failed shortly after takeoff when the crew was preoccupied with takeoff duties.

Rotor Blade Icing. Helicopter inflight icing difficulties are not always associated with the powerplant. The rotor blades are equally, if not more so, susceptible to inflight icing problems.

Helicopter operators in Canada, the U.S., Europe, and the Far East are familiar with the effects of helicopter rotor blade icing. North Sea pilots have reported extreme vibrations resulting from blade icing shortly after entering an icing environment. Occasionally, pilots have experienced vibrations sufficiently severe to prevent an accurate interpretation of cockpit instruments. U.S. Army test pilots have documented several occasions where test flights into natural icing conditions were abandoned only moments after entering the icing environment because of excessive vibrations caused by blade icing.

Airspeed reductions to 60-70 knots often will lessen vibrations resulting from blade icing. Such a remedy, however, treats only the symptom (severe vibrations) and not the illness (rotor blade icing).

Apart from causing severe vibrations, rotor blade icing challenges flight safety in an almost unnoticeable manner by deteriorating the rotor system's autorotational qualities. The adverse effects of main rotor icing on autorotational performance had gone relatively unnoticed for many years.

In the early 1970's, artificial and natural icing tests conducted by the U.S. Army revealed that moderate ice accumulation (approximately one-half inch) on inboard portions of the UH-1H rotor blade was sufficient to preclude a safe autorotation in the event of an engine failure. Even small amounts of rotor blade ice (one-eighth of an inch over one-third of the blade span) were noted by U.S. Army researchers to have a significant effect upon the UH-1H's autorotational characteristics.

The loss of autorotational qualities results from greater ice accumulation on the inner portions of the rotor disc, which directly affects the blade's efficiency with respect to upward airflows during autorotation. Consequently, when the leading edge of the rotor blade accumulates approximately one-half inch of ice on the first half of the blade span, minimum (safe) rotor RPM cannot be maintained during autorotation.

Helicopter pilots should not judge or estimate main rotor blade ice accumulations by observed buildups on the windscreen or other parts of the helicopter. A more reliable method for pilots of UH-1-type helicopters is to estimate ice buildup on the main rotor blades by monitoring the power required (torque indications). Researchers indicate that blade icing of one-half of an inch or greater on the UH-1 will be accompanied by a 5 to 6 psi torque increase over the "no-ice" power requirement. For other helicopters, a noticeable increase of 5-10 percent in power required while in the icing environment is reason to suspect a deterioration of autorotational performance.

Rotor Blade Ice Shedding. Many helicopter pilots are inclined to disregard the hazards associated with rotor blade icing and rely instead upon inflight ice "shedding" to mitigate the critical effects of ice accumulations on the rotor blades. While inflight ice shedding can (and does) occur, it is as likely to create a problem as it is to relieve one.

Symmetrical (affecting all rotor blades simultaneously in the same way) shedding of rotor blade ice in flight can be beneficial by restoring the rotor blades to a more efficient or clean configuration and by minor reductions in aircraft weight.

Asymmetrical shedding (affecting less than all of the main rotor disc), however, can create extremely severe vibrations, depending upon the amount of ice discharged, the rotor system, and other factors.

Asymmetrical shedding can be minimized by avoiding static air temperatures of below -5°C. Research indicates that, by operating in environments of -5°C or warmer, shedding generally will occur symmetrically. Tests with UH-1-type aircraft suggest that, by rapidly varying main rotor speeds or by going

into autorotation, symmetrical shedding may be induced when static air temperatures are -5°C or warmer. Collective and cyclic inputs generally are ineffective in producing symmetrical shedding and may result in asymmetrical shedding. *At temperatures below -5°C, generally it is not possible for the pilot to induce shedding.*

Rotor blade ice shedding presents still other dangers. Since ice shedding is most likely to occur when rotor RPM speed is varied significantly, the "shutdown operation" may send ice deposits from the rotors flying unpredictably in any direction at high speeds. Pilots and ground personnel should be especially alert when landing helicopters after flight in suspected icing conditions to ensure that ground personnel, other aircraft, and valuable property are well removed from the immediate area surrounding the helicopter to preclude injury or damage by rotor blade ice shedding.

Inflight Icing Operational Penalties. When helicopters enter the icing environment, severe operational penalties can be expected. To mitigate vibrations, airspeed often must be reduced significantly to the 60- to 70-knot range. Further, as the rotor blade's efficiency is deteriorated by ice accumulations, significant increases in power will be required, with an accompanying reduction in endurance and range. Maneuvering and performance also will be restricted as the blade-stall region is lowered markedly from the "no-ice" condition.

Hoists and cargo slings also have been known to malfunction after prolonged exposure to the icing environment. Unheated windscreens and windows also can be expected to ice over completely, reducing forward visibility entirely.

Options, Actions to Reduce Helicopter Icing Hazards. Over the long run, technological developments in helicopter design and support systems will enable the pilot to effectively cope with inflight icing hazards. Until research and technology progress to this point, however, the "actions and options" listed below may be of limited assistance to the helicopter pilot in minimizing the threat of inflight icing hazards:

- Monitor engine instruments continuously for indications of increasing power demands. Early detection of rotor blade icing may be noticed by increasing power requirements.
- Use weather reports and icing forecasts with caution. Current icing definitions used to describe the icing environment (trace, light, moderate, and severe) do not differentiate with respect to different types of aircraft. Therefore, a problem with these definitions is that a particular liquid water content and drop size distribution may be light with respect to one aircraft and moderate to another. The forecaster, however, does not differentiate between types of aircraft when forecasting icing conditions as "light" or "severe."
- Avoid icing conditions if uncertainty exists about the magnitude or scope of the icing environment. When unexpected inflight icing is encountered, do not hesitate to initiate any and all actions reasonably calculated to depart the icing environment expeditiously.
- Avoid abrupt or erratic cyclic and collective inputs when attempting to shed rotor blade ice accumulations, since such inputs may cause asymmetrical shedding and accompanying severe vibrations. Rapid variations in rotor RPM may be of some assistance in achieving symmetrical shedding.
- Recognize the extreme susceptibility of light helicopters to inflight icing. The limited power available and faster rotor systems of light helicopters make these aircraft extremely sensitive to inflight icing (severe vibrations, control difficulties, and insufficient power reserves).
- Do not attempt to judge or estimate main rotor blade ice accumulations by observed buildups on the windscreen or other parts of the aircraft, since ice accumulates on the rotor blades at an accelerated rate. A 5- to 10-percent increase in power required to sustain normal flight over the "no ice" condition is a more reliable method of determining critical rotor blade ice buildups.
- After flight in the icing environment, helicopters should be shut down to prevent shedding ice from main rotors and tail rotors from injuring personnel or damaging other aircraft or structures.
- When icing conditions prevail, avoid sustained flight in the upper half of cumulus and stratus clouds where large water droplets and high liquid water content normally are found.
- When severe vibrations due to blade icing occurs, reduce airspeed from normal cruise to 60-70 knots or less, depending upon the aircraft, mission profile, and prevailing meteorological conditions.
- Penetrate the airspace over mountainous terrain perpendicular to the mountain range so as to minimize the helicopter's exposure to intensive icing in regions where strong upward air currents on the mountain's windward side are capable of supporting larger than average water droplets, compounding the icing hazard.
- Never take off with even the smallest amount of ice on any of the rotor blades. Rotor blade efficiency is deteriorated by the smallest amounts of ice.

Adapted from an article appearing in the Nov/Dec '81 Flight Safety Foundation Helicopter Safety Bulletin. ◄

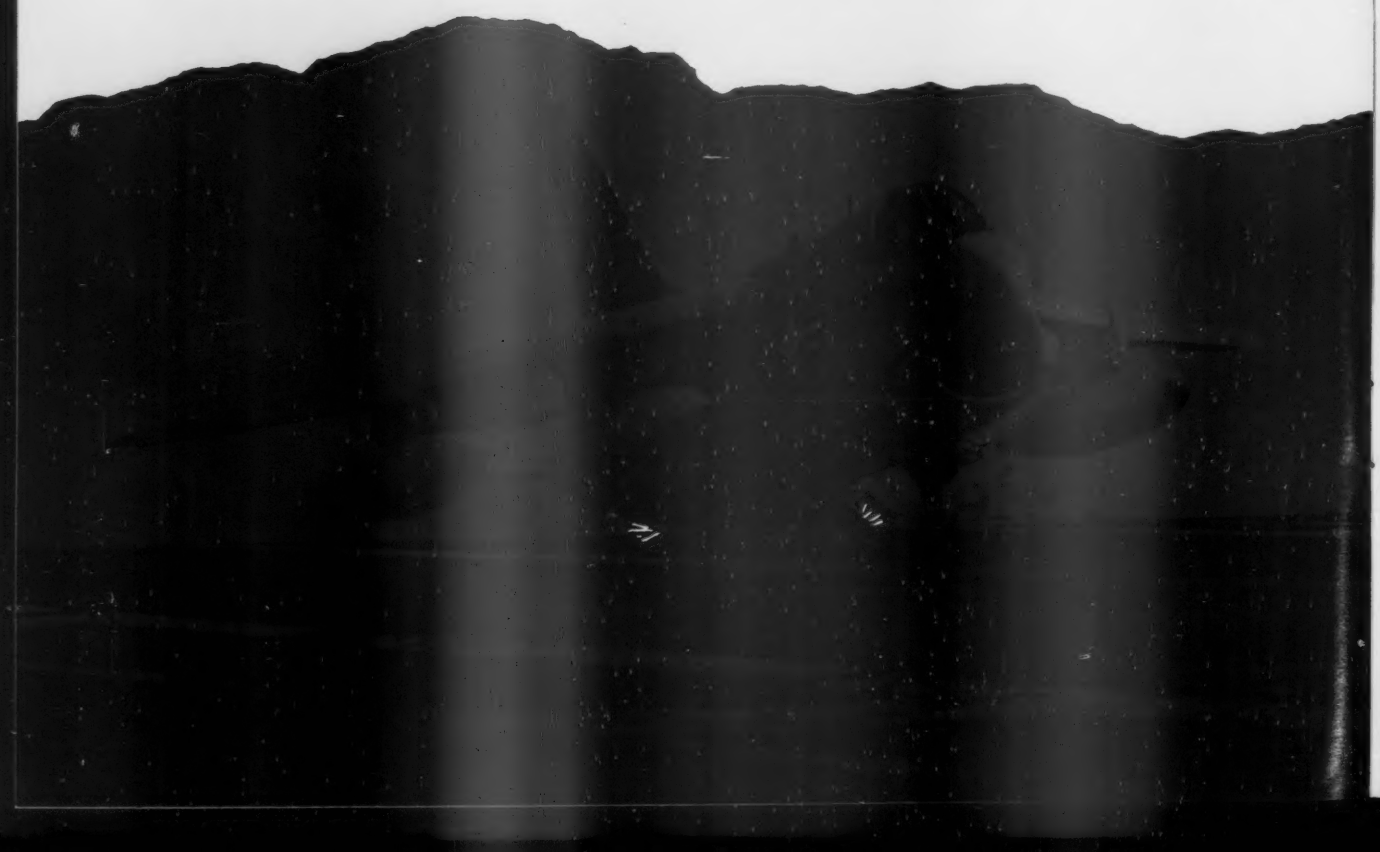
Violations of CV NATOPS minimums led to an A-7 RAMP STRIKE

By R. A. Eldridge
APPROACH Writer

EIGHT dark miles away from a night A-7 trap, the *Corsair* pilot switched to final approach frequency. Airspeed looked fine at 137 knots, and on the carrier, SPN-41 was down and SPN-42 was Mode 3 only. Continuing inbound, he was soon "locked up" and given approach instructions to a closed deck waveoff at 1 mile.

The waveoff and climb back to altitude went smoothly. At 6 miles downwind, the *Corsair* pilot took interval behind another aircraft, checked the carrier's silhouette, and then turned inbound to find the groove. He was not "locked up" at this point and *was not receiving glide slope information.*

"About 4 miles out, on the final bearing, I descended to 450 feet to intercept the ball. *(The CV NATOPS jet minimum altitude for a nonprecision approach is 600 feet, 1¼ miles.)* The next transmission I heard was *'204, what is your altitude?"* I called the ball with 4.0 fuel. I never heard the LSO respond. *(A mandatory waveoff was required!)* The ball was red, so I put on a bunch of power to get it up. I moved up to a yellow ball, and I took off power to readjust. The ball went red again. The waveoff lights came on at this point. This startled me and I hesitated before going to



MILITARY power. I don't know how long it took me to react, but I remember the waveoff lights scared me. I don't recall what the engine was doing, but I realized real soon that I wasn't going to make it."

The LSOs. At the instant the controlling LSO activated the waveoff lights with his pickle switch, in his peripheral vision he observed the backup LSO doing the same thing. Later, the LSOs said that the pilot failed to respond and the A-7 continued to settle from the in-close position until contact with the ramp. Numerous oral waveoff calls were given in addition to the waveoff lights. The aircraft crashed into the ramp in a slightly cocked-up attitude. The *Corsair* was on speed throughout the approach, with no noticeable attitude deviations until it became cocked-up just prior to striking the ramp. At impact, the aircraft's nose slammed forward to a 60-degree nosedown attitude. After hitting the ramp, the pilot pulled the lower ejection handle and ejected.

The pilot landed hard on the flight deck with a full chute and was ripped across the deck's nonskid surface. He received a compression fracture of his 12th thoracic vertebra, a fracture of his right ankle, and abrasions to his palms, fingertips, left elbow, and left knee. The injuries to his ungloved hands hindered him in his efforts to release his Koch fittings and inflate his LPA. His drag aft along the flight deck ceased when he skidded to a stop beneath an F-14. His ordeal was over!

The controlling LSO, a designated trainee, had been having difficulty with his URC-9 radios and, in fact, had been unable to receive transmissions for any of the three preceding aircraft approaches. However, the backup LSO, a qualified squadron LSO, did have communication and had rogered the previous three ball calls. When the mishap aircraft reached three-quarters of a mile, the backup LSO determined that neither he nor the controlling LSO had two-way radio communication with the *Corsair.*

The senior air wing LSO was on the platform, observing the recovery. He could tell there were problems with frequency coordination but observed that at least one LSO had positive contact with each preceding aircraft. When the backup LSO indicated that he didn't have contact with the *Corsair,* the senior LSO bent over the radio control console and, using the phone talker's flashlight, saw the top barrel switch was on FINAL A/B and the bottom barrel switch was on URC No. 2 (i.e., FINAL B frequency). He had difficulty with the flashlight and had to shake it several times to keep it operating. As he was switching the top barrel switch to FINAL A, he heard someone saying "wave off" and observed the waveoff light console indicator flashing. Before switching the bottom barrel to URC No. 1 (FINAL A frequency), he heard several more frantic "wave off" shouts and stood up. He saw the aircraft's final 2-3 seconds before striking the ramp. Although he heard the engine immediately prior to impact, he was unable to approximate its power setting.

The LSO Phone Talker. An LSO phone talker receives the frequency for the next approaching aircraft from the CCA control room and is responsible for setting the barrel switches to that frequency. On the trap before the *Corsair's,* the switches were set to Channel A and URC No. 1. The phone talker stated that he received word that 204 was on FINAL A and thus set the radios to A. However, his movement of the switches took the radios off A frequency. That's why the senior LSO found them on A/B and URC No. 2. The A/B selector was set to the BRAVO frequency in CATCC.

No Illumination. There was no illumination on the barrel switches, and a flashlight had to be used in order to see the switch position. Since this was the first night of cyclic operations, it was also the first night that frequency changes were necessary during the at-sea period.

CCA Controllers. The flow of air traffic had been congested because of two waved-off aircraft in the downwind pattern. The mishap pilot had reached 3 miles astern before the CCA supervisor realized that handoff to the ACLS controller had not been accomplished. The controller attempted to move his gates in for lock-on, but because the *Corsair* had curiously descended on his own to 450 feet, the controller was searching higher up, in the area of normal acquisition. No transmission was made to the *Corsair* until the supervisor took over and asked for his altitude at 1½ miles. No ACLS lock-on was accomplished and the *Corsair* was advised to take Angels .8 and call the ball at 1 mile.

The Pilot's Approach. Prior to the ball call, the pilot did not ask CATCC why he wasn't receiving glide slope information. He also didn't wonder out loud why no one was talking to him on an ACLS Mode 3 approach. At 4 miles, he "cheated" by descending to 450 feet. When questioned later, he said he thought it would be easier to see the ball at that altitude. When instructed to call the ball, he did so but received no reply from the LSO. From that point on, everything went downhill.

The pilot had never flown an unassisted night carrier approach in which he was required to fly the glide slope without cockpit needles, voice communication from CATCC, or positive LSO control. Thus, he was confronted with an unfamiliar situation and, in attempting to improvise, descended to 450 feet. When he intercepted the glide slope and called the ball, he was much closer to the ramp than normal and had very little time to make corrections and get comfortably established on the glide slope. All of the above contributed to an increased pilot workload that legislated eloquently and dangerously against a successful carrier landing.

The crux of this entire mishap can be summed up by an all-inclusive statement that should be burned into the memory of every carrier aviator. "There are only two options during a carrier approach: (1) continue the approach after acknowledgement from the LSO, or (2) wave off."

It's that simple. ◄

Capt Mike Rasmussen
1st Lt Steve Schmidt
Sgt Ken Boone
HMM-163

"TEN miles from the nearest land and we're going down!" That was all the crew of the CH-46D could think of as they started their descent to the ocean.

It all started when Capt Mike Rasmussen, 1st Lt Steve Schmidt, and Sgt Ken Boone were detailed from MCAS(H) Futema, Okinawa to NAF Atsugi, Japan to pick up a newly-reworked helicopter. The return trip to Okinawa was about 800 miles and called for several intermediate refueling stops. The last leg, from Kanoya, Japan to MCAS(H) Futema, was 300 miles over water with a few islands interspersed to break the monotony.

Capt Mike Rasmussen (right), Ist Lt Steve Schmidt (center), and Sgt Ken Boone.

The flight proceeded routinely until the last leg. The mishap helicopter was No. 3 in a three-aircraft formation when the pilots encountered a sudden and uncontrollable lateral vibration. The aircraft then developed a severe beat. The copilot, who was at the controls, lowered the collective instantly and headed for the water. The descent from 2,500 feet seemed like a lifetime, especially since the beat was so severe that it caused the failure of the UHF radio, bounced the pilots 5 inches out of their seats, and threw the crew chief to the cabin floor. As they neared the water, the pilots managed to flare the helicopter in order to dissipate their airspeed. They then executed a flawless emergency water landing, touching down with no forward airspeed.

Capt Rasmussen, thinking that the aircraft might break apart, secured the engines and rotors and exited through the cabin door. Sgt Boone, the crew chief, had already thrown the raft into the water and inflated it. By the time the pilots were out of the cockpit, Sgt Boone was paddling the raft into position beside the aircraft.

The helicopter floated approximately 20 minutes, allowing the pilot and copilot time to look for the cause of the extensive vibrations. Their inspection revealed a missing de-ice blanket on the aft yellow blade, a condition indicative of extreme dynamic imbalance. Although the aircraft was not recovered, knowing the probable cause led to a sequence of events to eliminate this hazard.

It was only through proper crew coordination, decisive action, and superior airmanship that no lives were lost.

BRAVO ZULU

LCDR Mike Fox
LTJG Frank Riner
VS-28

An S-3A was practicing some inflight refueling with a tanker-configured A-7E in the operating area near Roosevelt Roads, Puerto Rico. Following two successful plugs, a third attempt was aborted by the pilot. The S-3 immediately became laterally unstable and began to vibrate severely. The pilot, LCDR Mike Fox, and COTAC, LTJG Frank Riner, quickly noted normal indications on all engine instruments and requested a visual check by the tanker pilot. The tanker pilot confirmed what LTJG Riner had seen moments before – the fixed portion of the inboard starboard wing leading edge flap had come loose and was hanging directly into the airstream below the wing's leading edge. Quickly assessing the problem, LCDR Fox turned the aircraft towards NAS Roosevelt Roads and declared an emergency while his crew completed the NATOPS controlled ejection checklist.

En route, the crew determined that 230 KIAS was the minimum controllable airspeed in the clean configuration. Below this airspeed, the starboard wing would stall and the aircraft would begin to roll off. A transition to the landing configuration was then attempted. Although the trailing edge flaps locked up almost immediately due to the disturbed airflow over the starboard wing, lowering the leading edge flaps permitted the airspeed to be reduced sufficiently to lower the landing gear.

In this configuration, LCDR Fox and LTJG Riner stabilized the S-3 at 185-190 knots, checked its flying characteristics, and decided to attempt a landing at Roosevelt Roads. Demonstrating superb airmanship, LCDR Fox executed a flawless 185-knot approach and landing.

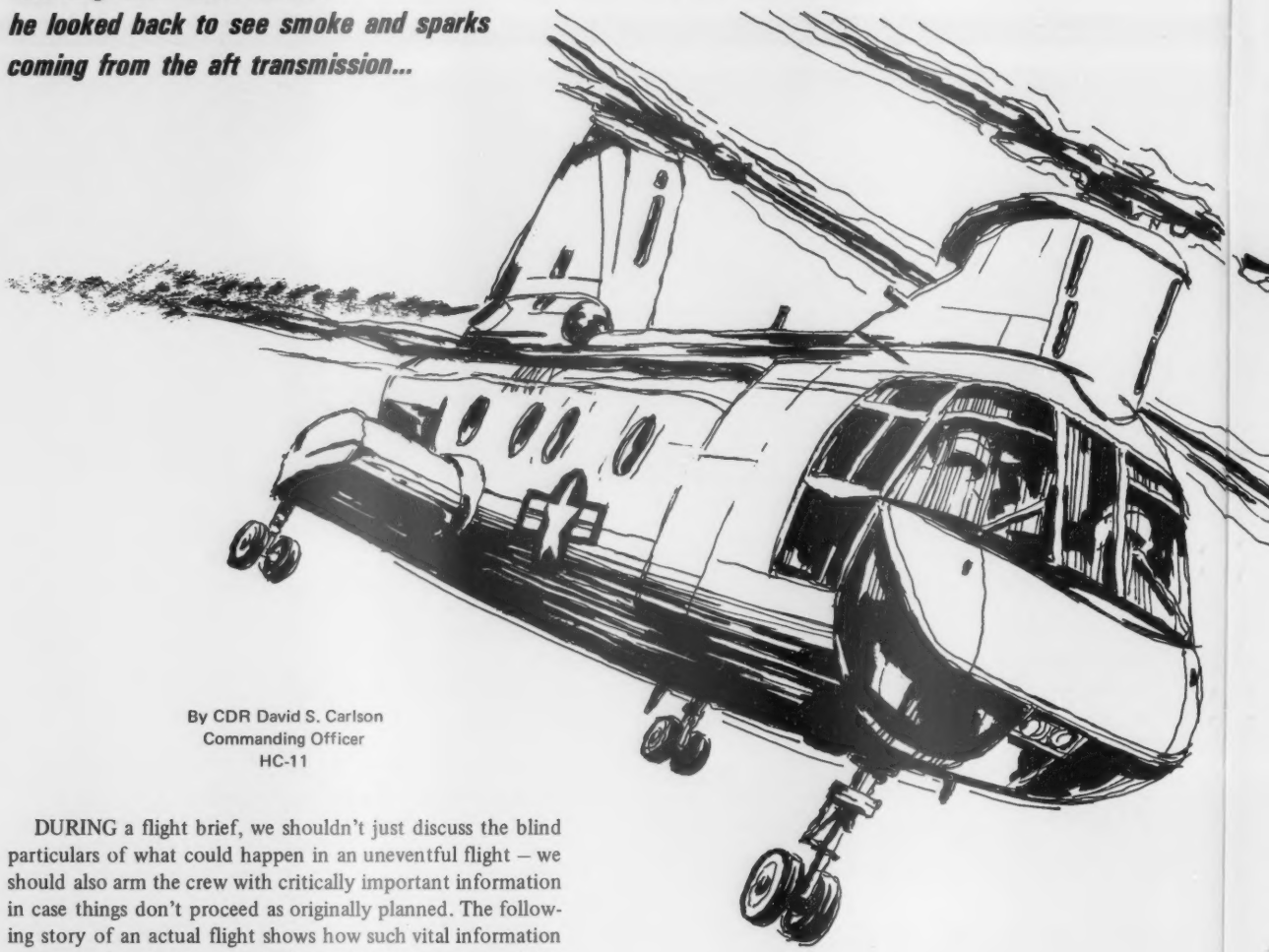
Postflight inspection revealed that the rigid rod that normally secures the fixed inboard portion of the leading edge flap to the starboard wing had separated. A combination of fluctuating wing G-loads and wingtip vortices from the A-7 apparently caused the leading edge flap to jar loose and fall into the airstream.

LCDR Fox and LTJG Riner coolly and professionally responded to a unique and potentially dangerous situation. The combination of superior airmanship and close crew coordination prevented the loss of a valuable aircraft and the possible loss of its crew.

LCDR Mike Fox (right) with LTJG Frank Riner.

Red Letter Day in the single-engine envelope

Vibrating with the airframe, he looked back to see smoke and sparks coming from the aft transmission...



By CDR David S. Carlson
Commanding Officer
HC-11

DURING a flight brief, we shouldn't just discuss the blind particulars of what could happen in an uneventful flight – we should also arm the crew with critically important information in case things don't proceed as originally planned. The following story of an actual flight shows how such vital information can shape the decisions made by an aircrew when there's no time to leaf through the NATOPS Manual or guess at the best course of action.

The mission was an overwater H-46 logistics and passenger run from a naval air station to USS CARRIER. Conducting the brief with the help of our squadron briefing card, the copilot devoted particular attention to single-engine capability. Power required versus power available for the expected flight regime was calculated, and maximum aircraft weight was computed for the single-engine flight envelope.

The helicopter aircraft commander (HAC) briefed that cruise altitude would be 1,000 feet AGL. He added that primary means of weight reduction on this flight would be fuel jettisoning. "Emergency water landing," the NATOPS emergency of the day, was discussed in detail.

Preflight revealed no major discrepancies. The blue-sky transit to the carrier was uneventful.

Once at the carrier, the *Sea Knight* got a hot drink while 18 passengers and 1,500 pounds of baggage came aboard for the 80-mile overwater return to the naval air station. Prior to liftoff, the pilots calculated takeoff weight to be 22,600 pounds. Takeoff and departure were normal.

The copilot was at the controls, flying straight and level at 110 knots and 1,000 feet. Approximately 12 miles west of the destination airfield, the helicopter experienced a loud thump and the onset of moderate high-frequency vibrations that shook the entire airframe. A loud howling sound accompanied the vibration.

Both pilots initially believed they were experiencing a transmission problem. The copilot initiated NATOPS im-

minent transmission failure procedures by reducing power and decreasing airspeed. Moments later, the HAC took control of the H-46 and continued a gradual descent.

The pilot broadcast an emergency radio transmission while the copilot squawked emergency on the transponder. During the broadcast, the No. 1 ENGINE FIRE warning light illuminated.

The crew chief, in a gunner's belt, was crouched at the cockpit entry. He looked back to see smoke billowing from the aft transmission area and reported this to the pilots. Vibrating with the airframe, the second crewman also observed smoke and sparks coming from the transmission area.

Approximately 10 seconds later, the No. 2 ENGINE FIRE warning light came on. No secondary malfunction indications were observed from either engine, nor were there any abnormal indications regarding transmission pressures or temperatures.

Due to the confusing airframe vibrations, howling sound, smoke and spark emanations from the aft transmission area, and illumination of both fire warning lights, the HAC was uncertain as to the exact source of the emergency. He reasoned that the No. 1 engine may have been breaking up internally and throwing turbine blades. This flying debris could have penetrated the common firewall between the two engines, allowing the flames to activate the No. 2 ENGINE FIRE light. The pilots quickly conferred and diagnosed the No. 1 engine on fire. Engine-fire-in-flight procedures followed. The HAC directed the copilot to secure the No. 1 engine, pull the fire T-handle, and discharge the fire-extinguishing agent.

Meanwhile, the crew chief turned his attention to the security of the passengers in a smoke-filled cabin area and dispatched the second aircrewman aft with the portable fire bottle.

As the No. 1 engine wound down, the vibrations ceased. Both fire warning lights went out when the fire-extinguishing agent was activated.

With the fire and vibrations under control and 600 feet of altitude remaining, the pilots continued with the single-engine procedures. The HAC increased collective to maximum single-engine power but was unable to maintain altitude, since the aircraft was over 1,000 pounds too heavy to maintain level flight. With the rotor RPM at 94 to 96 percent and 900 pounds of fuel in each stubwing tank, the pilots initiated fuel jettisoning.

Back in the cabin area, the crew chief and second aircrewman prepared the helicopter and passengers for ditching and evacuation. The copilot started and selected the auxiliary power unit and secured the No. 1 boost pump. The naval air station tower was requested to send airborne helicopters to the vicinity of the aircraft in distress should their services be required.

The maximum gross weight for the single-engine flight envelope was finally reached, and the descent stopped at 300 feet. Fuel jettisoning was secured at 300 pounds per side.

During the descent, the pilots considered flying the 15-degree right yaw maneuver, using the emergency throttle for additional power, and jettisoning the cargo in an effort to minimize rate of descent. None of these options was required, however, because the single-engine envelope for level flight was obtained. The copilot reviewed ditching procedures with checklist in hand and switched the UHF antenna to EMERGENCY. The landing checklist was completed, and a running landing and shutdown were executed at the naval air station. Eighteen relieved passengers disembarked and congratulated the flightcrew.

The following items discussed at the brief were responsible not only for the successful completion of the flight but also for preventing a forced water landing:

- Knowing exactly the dimensions of the single-engine envelope.
- Flying at an altitude which provided a safety cushion in time – time for the aircrew to react to single-engine emergency conditions.
- Discussing all emergencies that could impact on the safety of the mission in advance.
- Understanding precisely the individual responsibilities of each crewmember in normal as well as emergency conditions.

Although correct diagnosis of a confusing inflight malfunction and correct application of NATOPS procedures played a key role in this flight, it was obvious to every member of the flightcrew that the flight brief was clearly the most decisive factor in bringing this flight to a happy ending.

Incidentally, the cause of this incident turned out to be a material failure of the Thomas coupling of the No. 1 high-speed shaft. One of the three mounting bolts, with nut attached, was thrown from its mount. This produced an out-of-balance condition which warped the high-speed shaft and unseated the engine oil seal, allowing oil to spill onto the combustion chamber, where it ignited. The cause for the illumination of the No. 2 FIRE WARNING light remains unclear. A small separation in the stainless steel firewall between the engines may have allowed flames from the fire in one engine compartment to penetrate the common firewall and activate the detection system in the other. ◄

It can't happen to me!

IT all seems to have started on my way to supply to draw a flight suit. As I perused my flight logbook, my eyes fixed on the "zero accidents" notation and I briefly reflected on the combination of skill and luck that had seen me to the 20-year mark of my career – accident free! A fleeting negative thought was replaced by optimism: I've got it made. Only a year or so more of flying and then retirement to watch, with fond memories, my F-4 buddies do their thing. It can't happen to me. I've always been lucky . . .

My pilot and I had always been close. As two heavies in charge of an F-4 squadron and a supporting HAMS unit, it was natural that we should be crewed together. Only one day had passed since my supply run, and there I was in my brand new flight suit in his back seat. It was a Marine Corps Combat Readiness evaluation flight, absolutely the most thoroughly planned and briefed hop I have ever flown. Our assigned mission was low-angle bomb delivery.

Suddenly, 20 minutes into the flight, after catching a single bomb frag in the engine bay (*Snakeye* fin failure), we were making an emergency approach, single-engine, utility hydraulics and PC failure, the works! We handled the preliminaries with the expected aplomb of two heavies, and on short final, 300 feet AGL, all seemed well as I attended to the matters at hand (reading airspeeds, etc.). Deep in the recesses of my brainhousing group, I was thinking *got it made, just another emergency landing, no sweat . . . I'll have a chance to practice emergency egress.*

A slight but sudden drop in the airspeed, accompanied by an unusual yawing motion, caught my immediate attention. Almost instinctively, I called waveoff (twice), and simultaneously, from my low-but-comfortable position in the seat, I peered out the cockpit in the direction of "turn" only to see ground coming up fast. I still lacked a complete perspective of the prevailing *extremis* situation (the pilot was busy – this part of the story has about a 2-second time history).

During my second waveoff call (actually two continuous calls), I was introduced to Martin-Baker unannounced, at 150 feet AGL, 5 degrees nose down, and 20 degrees left wing down, with sink rate and roll rate not helping the situation. The next time I had full situational awareness, I was sitting on my tail in a big cloud of dust (about 5 seconds after my waveoff call!) with crash trucks, ambulances, and crazy people running all around. Some waveoff! While coming to my senses, I had the incredible thought – *No, this can't happen to me . . . I am witnessing an illusion, someone else's accident.*

During my aviation career, I've always enjoyed reading about the hair-raising experiences of others, but I've usually been faced with conflicting thoughts (I would share such mishap experience with others, but I won't have to, since it can't happen to me). At last, it's time to pay my dues, to answer up with lessons learned, including, perhaps, a few new thoughts. The first one is a reality RIOs tend to repress, and I am no exception.

RIOs are not in the "control loop" and are thus inherently at least 1 to 2 seconds behind the airplane in sudden, out-of-control situations. This requires a RIO to make every attempt to anticipate an *extremis* situation and take the appropriate corrective action. As much as it bothers me to admit it, I alone did not have the lead time to initiate command ejection within the envelope.

In this case, the pilot released the stick and initiated command ejection with the face curtain. A little more envelope might have been available (scant little was left!) had:

The pilot initiated ejection with the lower handle.

The pilot, prior coordination assumed, called for the RIO to initiate command ejection. (The pilot in this case

By LtCol J. A. Marshall, USMCR
H&MS-41, MAG 41
Andrews AFB

had requested "no command" from the rear cockpit before the approach.)

"Prepositioning" works. I had tightened my straps and oxygen mask just in case of such an eventuality. I landed with all equipment intact, and despite my surprise, I had no ejection injuries save for a slightly-bitten tongue sustained because I was talking at the moment of ejection.

Don't lower the seat so far that you lose ground perspective.

The pilot alerting the RIO, among other things, allows postejection thought processes to begin much sooner and may prevent landing injury.

A fastened seat survival kit is prone to cause leg injuries (pulled knee ligaments in this case) in low-level, overland ejections. Release it if you can!

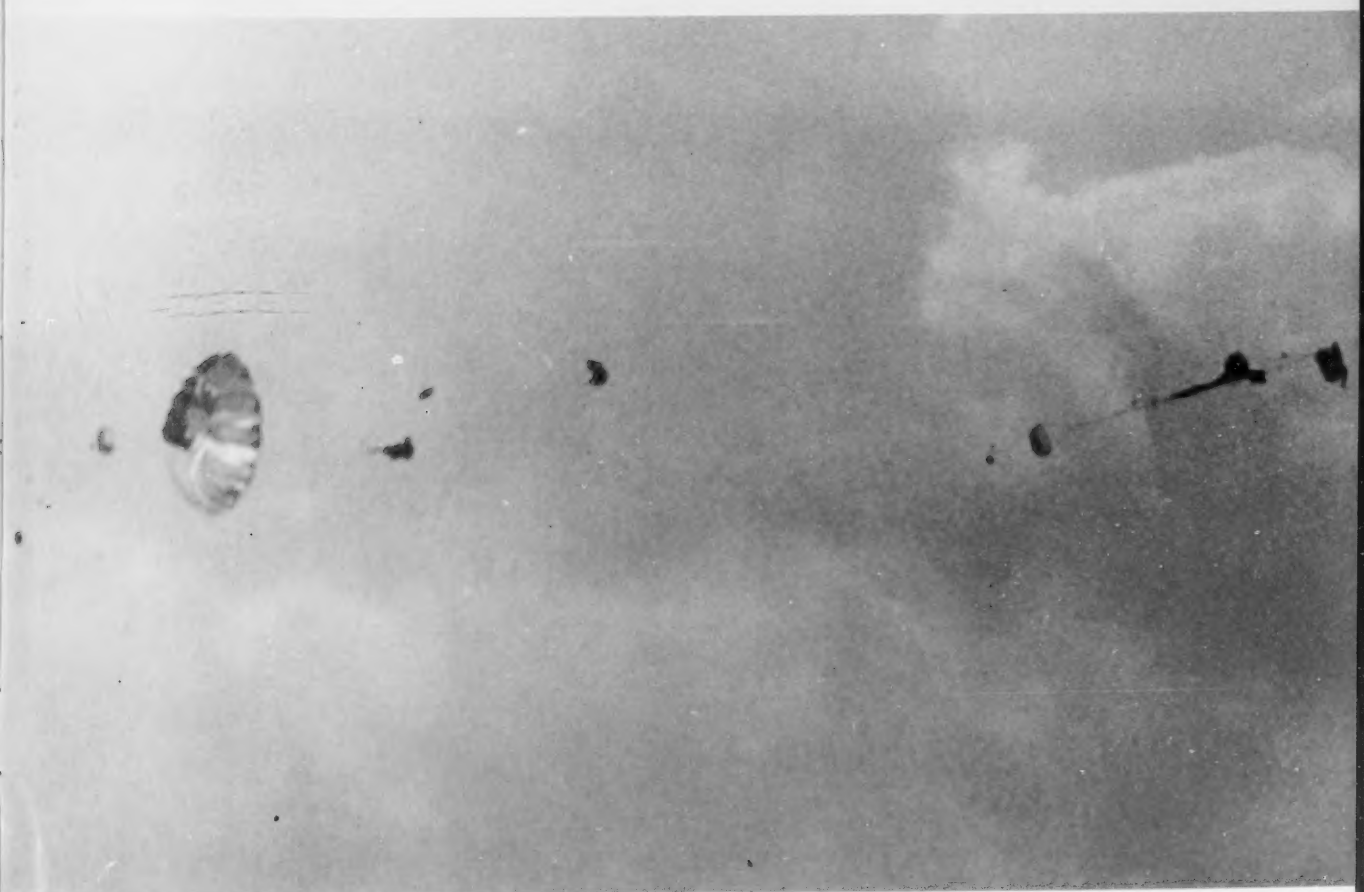
Know your NATOPS cold. Read the procedures for this type of emergency! (I was less than a month from my annual NATOPS exams/check.) Call base radio when in doubt. In retrospect, a little more knowledge or coaching might have convinced us to:

Go faster in this type of emergency (230 knots for waveoff capability). We elected "controllability" plus 10 knots. This wasn't enough.

And remember, be ready for the worst – IT CAN HAPPEN TO YOU!

Fortunately, this story has a happy ending. It was a walkaway for both pilot and RIO thanks to quick pilot reaction, Martin-Baker, and a lot of luck (overseen by higher authority).

Are you thinking "It can't happen to me"? ◄



"I am witnessing an illusion, someone else's accident."

LETTERS

Why Wink or Smile at Danger?

Brunswick, ME – Quite often a pilot, NFO, or aircrewman will approach me and ask, "Doc, can you give me something for this cold that won't down me?" My response is always "No," and the individual usually ends up walking away. He still has his cold and is intent on flying. And if he decides to take over-the-counter medication, he may well be asking for big trouble.

From my point of view as a hospital corpsman, there has to be some reason for these individuals' insistence on remaining in a flight status under such conditions. It seems that many of them are simply dedicated to flying, which is admirable. On the other hand, many express concern over the hassle they receive from other fliers or supervisors. I've personally had supervisors visit me in sick-bay wanting to know why I've downed a flightcrew member. At times, they make it sound as though I'm the one who's doing something improper.

If supervisors and fliers could only stop and think of the possible damage done by a sick aircrew member, maybe they could better understand the medical reasoning behind the decision to ground him. Even a slight cold can cause a serious ear block, a condition which, in addition to being extremely painful, can cause permanent damage. Of course, this can happen even without a cold, but with one, the chances are greatly increased. As far as other illnesses are concerned, the effects vary with the individual, and that makes them all the more dangerous.

The pride and friendship I witness every day in the aviation community is like nothing I've ever seen before. So why take a chance of risking your life or that of a friend? Why wink or smile at danger? The sooner you seek treatment for your illness, the sooner you'll be back in the air!

HM2 J. R. Fredrickson
Medical Department
VP-11

True Confessions

Norfolk, VA – When an aviator makes an error of any kind, its repercussions are bound to be more profound than errors of those made in most other professions. We all know this is true, but naturally, we don't like to call attention to our own swell foops! In VAW-126, we've changed our thinking.

It became obvious that our individual mistakes were not unique and that we could all benefit from the experience of our squadronmates. Therefore, periodic "true confession" sessions have become an integral part of our safety and training programs. Everything which is discussed at these pilot-only meetings is kept in strict confidence. After an occasional laugh or sigh of relief, we regularly discover reasons to change SOP or recommend changes to the NATOPS. A special benefit for the "nugget" pilot is also notable: a bit of pressure is relieved by the revelation that even those "infallible" old plane commanders make mistakes too – less pressure equals better performance!

In general, the structure of this forum is designed to provide another means by which we can grow in our skills and thus expand our margin of safety. Call it "true confessions" or "Anymouse" or anything you like, but whatever you do, call it to everyone's attention!

LT Ralph R. Costanzo
VAW-126

How Sweet It Is

FPO, New York – To the Editor: My hat is off to *APPROACH* and to the author of "Some Things Never Change," which appeared in your April '82 issue. I am presently assigned to the squadron that "let a crew drink, then drive an airplane into a mountain." Reading the article sent chills up my spine, for I remember the tale well as told to me by shipmates who were in the squadron when the tragedy occurred. The fact that the same things are presently occurring in other squadrons is not surprising but disheartening. As the safety adage goes – we're not making new mistakes, we just have new people making the same old ones.

As a crew-holding plane/mission commander, I understand the pressure associated with short-notice operational tasking, but I also know the responsibilities associated with my position. A smart man once told me to do the right thing regardless of the consequences, because "it may not be popular, but you'll sleep better." If the squadron discussed in the article really does have a safety officer who "won't stand up to the CO" or, even worse, a commanding officer who "would order us to go anyway," then they are an accident waiting to happen. It doesn't take a genius to realize that safety and adherence to associated policies must have the full and untiring support of the chain of command. The bottom line, however, is *individual* responsibility and accountability. Nothing new, just the way it is.

Name withheld by request

Note

CAPT Horst A. Petrich has reported to the Naval Safety Center as Chief of Staff.

His most recent assignments were as Special Assistant for Command and Control, SACLANT, and as Chief of Staff, Joint Control Group for CINCLANTFLT's joint exercises Ocean Venture '82 and Northern Viking '82.

CAPT Petrich previously commanded VRC-40 and the Navy's Reserve Tactical Support Wing. His safety experience includes tours as Squadron Safety Officer, VS-36, and as (the first) Ship's Safety Officer, USS NIMITZ.

Open Letter to Parachute Riggers

FPO, New York – This is an open letter to all parachute riggers, PR1 through PRCM in particular:

I'm alarmed at the number of recent safety reports and QDRs concerning our rate, especially the recent discrepancies being reported on the NES-12M parachute. Is it going to take a manslaughter charge before we get up from behind our desks and venture out into the work centers to observe what our people are doing?

We have representation at the Safety Center and Type Commander. Are we using them? Are "A" school and "C" school giving the fleet the quality graduates we need to perform the tasks? If not, are we providing Lakehurst with any feedback?

Accepting anything less than perfection when the lives of people are at stake is unsatisfactory.

Manuals should be open and in use during the packing operation, and a qualified CDI should be present to examine carefully every step he is required to inspect.

It's very obvious that if existing safety guidelines were being followed, 99 percent of the discrepancies being reported would be eliminated. Like it or not, each discrepancy is an insult to our rate and to our professionalism.

PRCM W. L. Gary
USS AMERICA (CV 66)

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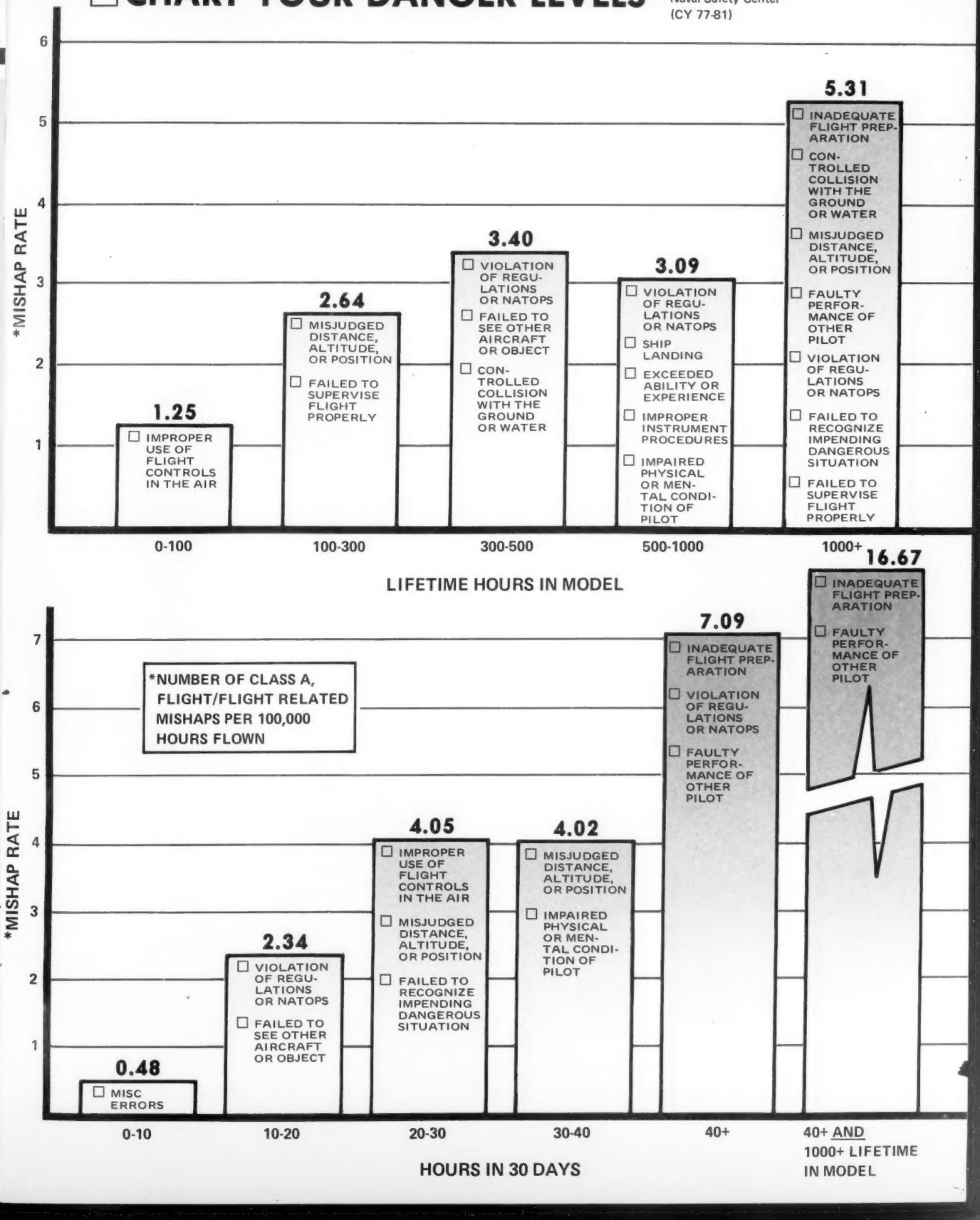
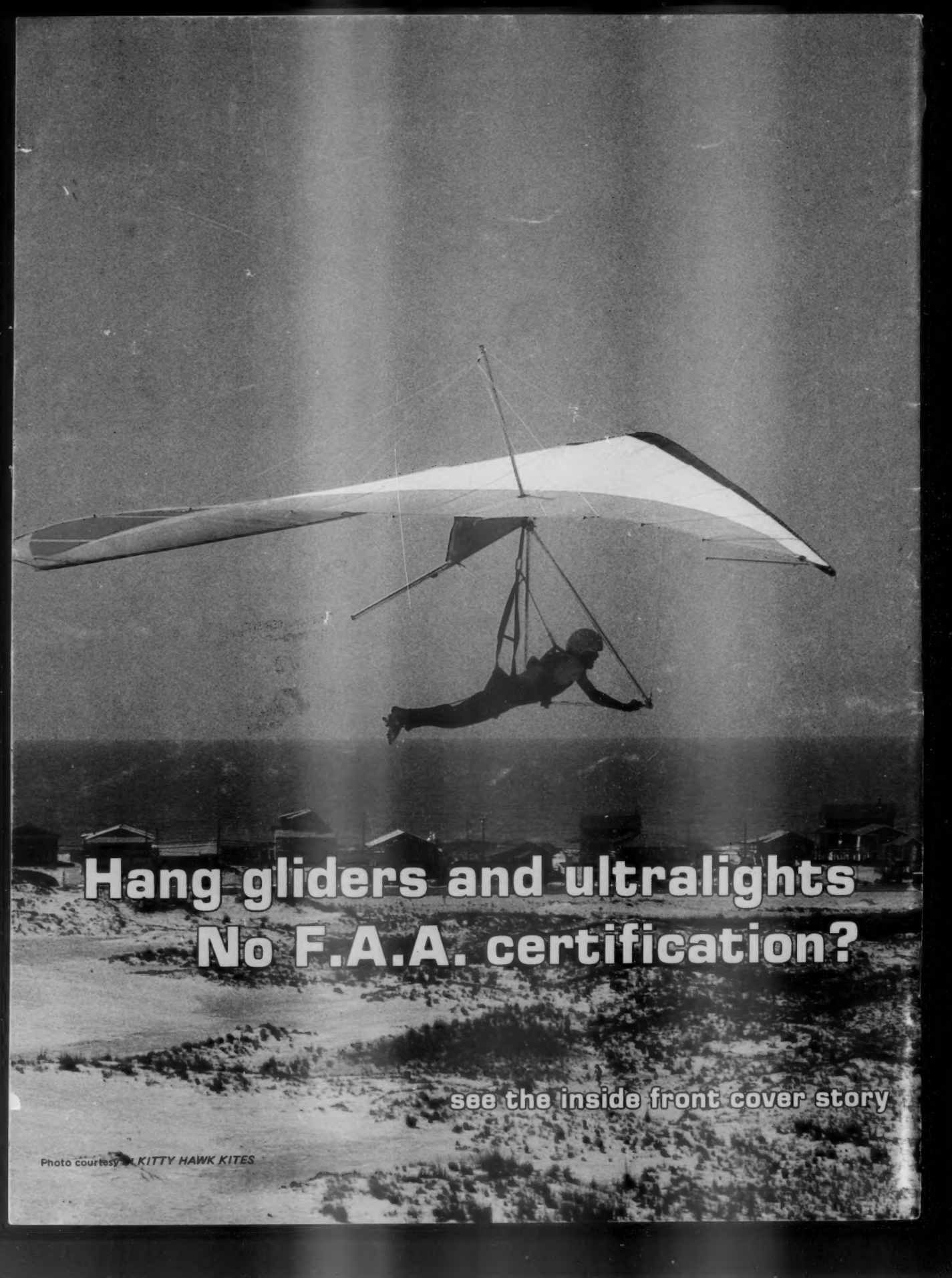
*MISHAP RATE

*MISHAP RATE

HELICOPTER PILOTS:
☐CHART YOUR DANGER LEVELS

Research by
Dr. M. S. Borowsky
LT R. A. Wall
Naval Safety Center
(CY 77-81)




Hang gliders and ultralights
No F.A.A. certification?
see the inside front cover story
Photo courtesy of KITTY HAWK KITES